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AGRICULTURAL RESEARCH INSTITUTE
PUSA

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY,

INCLUDING

ZOOLOGY, BOTANY, AND GEOLOGY.

(BEING A CONTINUATION OF THE 'ANNALS' COMBINED WITH LOUDON AND
CHARLESWORTH'S 'MAGAZINE OF NATURAL HISTORY.')

CONDUCTED BY

ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.R.S.,
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AND
WILLIAM FRANCIS, F.L.S.

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"Omnes res creatæ sunt divinæ sapientiæ et potentiæ testes, divitiæ felicitatis humanæ:—ex harum usu *bonitas* Creatoris; ex pulchritudine *sapientia* Domini; ex œconomiâ in conservatione, proportione, renovatione, *potentia* majestatis elucet. Earum itaque indagatio ab hominibus sibi relictis semper æstimata; à verè eruditis et sapientibus semper exculta; malè doctis et barbaris semper inimica fuit."—Linnæus.

"Quel que soit le principe de la vie animale, il ne faut qu'ouvrir les yeux pour voir qu'elle est le chef-d'œuvre de la Toute-puissance, et le but auquel se rapportent toutes ses opérations."—Bruckner, *Théorie du Système Animal*, Leyden, 1767.

. . . . The sylvan powers
Obey our summons; from their deepest dells
The Dryads come, and throw their garlands wild
And odorous branches at our feet; the Nymphs
That press with nimble step the mountain-thyme
And purple heath-flower come not empty-handed,
But scatter round ten thousand forms minute
Of velvet moss or lichen, torn from rock
Or rifted oak or cavern deep: the Naiads too
Quit their loved native stream, from whose smooth face
They crop the lily, and each sedge and rush
That drinks the rippling tide: the frozen poles,
Where peril waits the bold adventurer's tread,
The burning sands of Borneo and Cayenne,
All, all to us unlock their secret stores
And pay their cheerful tribute.

J. Taylor, *Norwich*, 1818.

ALERE FLAMMAM.

CONTENTS OF VOL. VI.

[EIGHTH SERIES.]

NUMBER 31.

Page

I. Descriptions of Twenty-nine Species of Marine Mollusca from the Persian Gulf, Gulf of Oman, and North Arabian Sea, mostly collected by Mr. F. W. Townsend, of the Indo-European Telegraph Service. By James Cosmo Melvill, M.A., D.Sc., F.L.S. (Plates I. & II.) 1

II. Descriptions and Records of Bees.—XXX. By T. D. A. Cockerell, University of Colorado 17

III. Notes on Amphipoda. By Alfred O. Walker, F.L.S., F.Z.S. 31

IV. Some new Late Pleistocene Voles and Lemmings. By Martin A. C. Hinton 34

V. *Microchærus erinaceus* (Wood). By C. Forster-Cooper, .A., F.Z.S., Trinity College, Cambridge, University Demonstrator Animal Morphology. (Plate III.) 39

VI. On new Species of *Histeridæ* and Notices of others. By . Lewis, F.L.S. 43

VII. Further Additions to the Molluscan Fauna of Central Africa. H. B. Preston, F.Z.S. (Plates IV. & V.) 58

VIII. On a few new Bornean Beetles of the Rutelid Genera *Mimela* and *Anomala*. By Gilbert J. Arrow 64

IX. Notes on Fossorial Hymenoptera.—II. By Rowland E. urner, F.Z.S., F.E.S. 72

X. Rhynchotal Notes.—LI. By W. L. Distant 77

I. New Species of Diploptera in the Collection of the British um.—Part II. By Geoffrey Meade-Waldo, B.A. 100

Page

XII. A new Genus of Fruit-Bats and Two new Shrews from Africa. By OLDFIELD THOMAS 111

XIII. A new Cavernicolous Cockroach. By R. SHELFORD, M.A., F.L.S. 114

XIV. Descriptions of new African Moths. By Sir GEORGE F. HAMPSON, Bart., F.Z.S., &c. 116

New Books:—The South African Journal of Science, being the Organ of the South African Association for the Advancement of Science. Vol. VI. No. 6.—Catalogue of British Hymenoptera of the Family *Chalcididæ*. By CLAUDE MORLEY, F.Z.S., F.E.S. 141, 142

Proceedings of the Geological Society 143, 144

NUMBER 32.

XV. Description of new African Moths. By Sir GEORGE F. HAMPSON, Bart., F.Z.S., &c. 14

XVI. Descriptions and Records of Bees.—XXXI. By T. D. A. COCKERELL, University of Colorado 160

XVII. Descriptions of some new Species of Heterocera from East and West Africa and Tropical South America. By HERBERT DRUCE, F.L.S. &c. 168

XVIII. Mammals from the River Supinaam, Demerara, presented by Mr. F. V. McConnell to the British Museum. By OLDFIELD THOMAS 18

XIX. Descriptions of new Heterocera from Costa Rica. By W. SCHAUS, F.Z.S. 18

XX. Additional Notes on a Collection of Land-Shells from Muswar Island, New Guinea. By HUGH C. FULTON 21

XXI. On an undescribed Species of *Dorcasia*. By HUGH C. FULTON ....

XXII. Rhynchotal Notes.—LI. By W. L. DISTANT ....

XXIII. Notes on African Rodents. By OLDFIELD THOMAS 22

XXIV. Hornless Okapies. By R. LYDEKKER 22

XXV. Two new African Mammals. By GUY DOLLMAN 22

XXVI. Two new Oriental *Viverridæ*. By ERNST SCHWARZ. ..

Page

XXVII. New Neotropical *Geometridæ*. By LOUIS B. PROUT, F.E.S. 232

New Book:—A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution. A Text-book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. III. 247

NUMBER 33.

XXVIII. A Survey of the South-African *Stenogyrinæ*, with Descriptions of several new Species. By M. CONNOLLY. (Plate VI.) 249

XXIX. Descriptions and Records of Bees.—XXXII. By T. D. A. COCKERELL, University of Colorado 272

XXX. Bionomical Observations on some British Millipedes. By T. J. EVANS 284

XXXI. African Gerbils of the Genera *Tatera* and *Taterillus*. By R. C. WROUGHTON 291

XXXII. Preliminary Diagnosis of a new Stomiatid Fish from South-west of Ireland. By E. W. L. HOLT and L. W. BYRNE.... 294

XXXIII. The British Roe-deer (*Capreolus capreolus thotti*), a preliminary Diagnosis. By Dr. EINAR LÖNNBERG, C.M.Z.S. &c... 297

XXXIV. Description of the Indian Butterfly *Parantirrhœa marshalli*, W.-M. (female). By Lieut.-Colonel N. MANDERS, F.E.S. .. 298

XXXV. Descriptions of Five new Species of Ticks (*Ixodidæ*). By STANLEY HIRST and L. F. HIRST, M.D. 299

XXXVI. List of Mammals from Mount Kilimanjaro, obtained by Mr. Robin Kemp, and presented to the British Museum by Mr. C. D. Rudd. By OLDFIELD THOMAS, F.R.S. 308

XXXVII. New Neotropical *Geometridæ*. By LOUIS B. PROUT, F.E.S. 316

New Book:—The Biology of Birds. A History of Birds. By W. P. PYCRAFT, Zoological Department, British Museum. With an Introduction by Sir RAY LANKESTER, K.C.B., F.R.S. 333

NUMBER 34.

XXXVIII. New African Phlebotomic Diptera in the British Museum (Natural History).—Part VII. *Tabanidæ* (continued). By ERNEST E. AUSTEN 338

XXXIX. Descriptions and Records of Bees.—XXXIII. By T. D. A. COCKERELL, University of Colorado 356

Page

XL. On a new Genus and Species of the Order *Solifugæ* from Algeria. By S. Hirst 367

XLI. Rhynchotal Notes.—LII. By W. L. Distant 369

XLII. Hornless Okapies. By W. G. Ridewood 387

XLIII. A List of the Mammals obtained by Mr. R. B. Woosnam during the Expedition to Lake Ngami, with Field-Notes by the Collector. By Guy Dollman 388

XLIV. New Species of Heterocera from Costa Rica.—II. By W. Schaus, F.Z.S. 402

XLV. A Note on *Alouatta discolor* of Spix. By Guy Dollman. 422

XLVI. Descriptions of Three new Freshwater Fishes from West Africa. By G. A. Boulenger, F.R.S. 424

XLVII. New African Mammals in the British Museum. By Oldfield Thomas 426

XLVIII. New Neotropical *Geometridæ*. By Louis B. Prout, F.E.S. 432

New Book:—Catalogue of the Indian Decapod Crustacea in the Collection of the British Museum. Part I. Brachyura. Fasciculus II. The Indian Freshwater Crabs—*Potamonidæ*. By A. Alcock, C.I.E., M.B., LL.D., F.R.S., &c. 440

NUMBER 35.

XLIX. Descriptions of new Species of Heterocera from New Guinea. By G. T. Bethune-Baker, F.L.S., F.Z.S. 441

L. Descriptions of Six new European Mammals. By Gerrit S. Miller 458

LI. On Two new Carnivora from North-east Africa. By A. Cabrera, C.M.Z.S. 461

LII. Rhynchotal Notes.—LII. By W. L. Distant 465

LIII. The Anatomy and Classification of the Teleostean Fishes of the Order Zeomorphi. By C. Tate Regan, M.A. 481

LIV. The Origin and Evolution of the Teleostean Fishes of the Order Heterosomata. By C. Tate Regan, M.A. 484

LV. New *Unionidæ* from East Asia. By Dr. F. Haas, Senckenberg Museum, Frankfurt-a.-M. 496

LVI. On Mammals collected in Ceará, N.E. Brazil, by Fräulein Dr. Snethlage. By Oldfield Thomas 500

LVII. Four new South-American Rodents. By Oldfield Thomas 503

Page

LVIII. New Genera of Australasian *Muridæ*. By OLDFIELD THOMAS 506

LIX. New Neotropical *Geometridæ*. By LOUIS B. PROUT, F.E.S. 508

LX. Additions to the non-Marine Molluscan Fauna of British and German East Africa and Lake Albert Edward. By H. B. PRESTON, F.Z.S. (Plates VII.-IX.) 526

NUMBER 36.

LXI. On a large Collection of Fishes made by Dr. W. J. Ansorge in the Quanza and Bengo Rivers, Angola. By G. A. BOULENGER, F.R.S. 537

LXII. New Species of Heterocera from Costa Rica.—III. By W. SCHAUS, F.Z.S. 561

LXIII. Rhynchotal Notes.—LII. By W. L. DISTANT 585

LXIV. The Generic Arrangement of the Australian Murines hitherto referred to "*Mus*." By OLDFIELD THOMAS 603

LXV. New Australian *Muridæ* of the Genus *Pseudomys*. By OLDFIELD THOMAS 607

LXVI. A new Genus for *Dactylopsila palpator*. By OLDFIELD THOMAS 610

LXVII. Description of a new Volute. By G. B. SOWERBY, F.L.S. 611

LXVIII. On *Heterocuma sarsi*, Miers. By W. T. CALMAN, D.Sc. (Plate X.) 612

LXIX. On the Specific Names of certain Primates. By ANGEL CABRERA, C.M.Z.S. 617

LXX. Ten new Fruit-bats of the Genera *Nyctimene*, *Cynopterus*, and *Eonycteris*. By KNUD ANDERSEN 621

New Books:—Memoirs of the National Museum of Melbourne, No. 3.—Fourth Annual Report of the Committee of Control of the South African Locust Bureau. — Fische der Süd-See. Part IX. By Dr. ALBERT GÜNTHER .... 625—627

Proceedings of the Geological Society 628

Report of the International Commission on Zoological Nomenclature. *ib.*

Index 631

PLATES IN VOL. VI.

PLATE I. II.	Marine Mollusca from the Persian Gulf, &c.
III.	Microchœrus erinaceus (*Wood*).
IV. V.	Mollusca from Central Africa.
VI.	South-African Stenogyrinæ.
VII. VIII. IX.	Mollusca from British and German East Africa, &c.
X.	Heterocuma sarsi, *Miers*.

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

R. I. PU

“ …… per litora spargite muscum,
Naiades, et circum vitreos considite fontes:
Pollice virgineo teneros hic carpite flores.
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas,
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Deæ pelagi, et pingui conchylia succo.”
N. Parthenii Giannettasii, Ecl. 1.

No. 31. JULY 1910.

I.—*Descriptions of Twenty-nine Species of Marine Mollusca from the Persian Gulf, Gulf of Oman, and North Arabian Sea, mostly collected by Mr. F. W. Townsend, of the Indo-European Telegraph Service.* By JAMES COSMO MELVILL, M.A., D.Sc., F.L.S.

[Plates I. & II.]

THREE years have elapsed since the last paper was published treating of the Molluscan Fauna of the Persian Gulf and its dependencies. Since that time, mainly in 1907, Mr. Townsend forwarded some fresh consignments, for the most part consisting of dredged material from the neighbourhood of

(*a*) Karachi,
(*b*) Charbar,
(*c*) Astola Island,
(*d*) Henjam I.,
(*e*) Bahrein Is.,
(*f*) Bunder Abbas,
(*g*) Bushire,
(*h*) Bombay,

and it has taken a long time—indeed, the task is not yet finished—to properly examine these gatherings, a fact which is not surprising when the microscopic size of the bulk of the material is considered.

As is almost invariably the case in deep-sea products, the predominating molluscan families are Pleurotomidæ, first in point of numbers, followed by Pyramidellidæ, Trochidæ, Rissoidæ, and Cerithidæ.

In the following descriptive paper I have eliminated all members of the second family named—Pyramidellidæ,—as I have prepared, separately, a revision of the Gulf species, which I hope may be published this autumn; but examples of the remaining and other families will be found among the twenty-nine species now to be enumerated.

The time does not seem to have arrived for a new edition of the 'Catalogue of Gastropoda and Scaphopoda' published in 1901, though a considerable number of species could now be added, and several emendations would likewise have to be made at the same time.

Including the Pelecypoda, the catalogue of which was published only three years ago, the number of Mollusca enumerated from these seas amounts to over 1700 species, and of these it has been found necessary to describe more than a third as new to science.

Acknowledgments are due to Mr. G. B. Sowerby, Mr. E. R. Sykes, Mr. J. R. le Brockton Tomlin, and Mr. Edgar Smith, I.S.O., while our sense of indebtedness to Mr. F. W. Townsend has been, if possible, still further accentuated and enhanced by the fresh services he has rendered to the science of malacology during the past two years.

Cyclostrema tredecimlineatum, sp. n. (Pl. I. fig. 1.)

C. testa depresso-discoidali, minuta, alba, delicata, late umbilicata; anfractibus 4, quorum 1½ apicales mamillati, læves, nitidi, cæteris ad suturas leniter quasi-canaliculatis, penultimo spiraliter 3-, ultimo 13-lineato—supra sex, infra septem lineis prædito,—liris indistinctis, hic illic fortioribus; apertura obliqua, peristomate rotundo, continuo.

Alt. 1, diam. 2 mm.

Hab. Gulf of Oman, lat. 26° 6′ N., long. 50° 58′ E., 15 fathoms.

A rare and delicate species, white, discoidally depressed, with large umbilicus, four-wborled, two being apical, mamillate, the remainder ornamented with fine, somewhat indistinct and unequal spiral lines, thirteen in all upon the body-whorl, six being on the upper side, and seven basal, round the umbilicus. The periphery is not conspicuously angled.

Cyclostrema (*Tubiola*) *nugatorium*, sp. n. (Pl. I. fig. 2.)

C. testa depressa, profunde umbilicata, tenuissima, lactea; anfractibus 4, quorum apicales 2 apice ipso bulboso, vitreo, cæteris ad suturas obtuse canaliculatis, lævissimis, lineis incrementalibus sub lente longitudinaliter tenuissimis præditis, apud peripheriam rotunde depressa, basi lævi; apertura rotunda, peristomate tenui, fere continuo.

Alt. ·50, long. 1·75 mm.

Hab. Mekran Coast, Charbar, 40 fathoms.

Minute, but interesting. The little shell is milky white, smooth, and delicate, the incremental lines of growth being but barely distinguishable with a considerable power. The umbilicus is particularly wide and deep, and the shell itself almost a replica, but in miniature, of *Tubiola nivea*, Ch., from Japan.

Solariella iridifulgens, sp. n. (Pl. I. fig. 3.)

S. testa conica, umbilicata, lævissima, pulchre iridescente, tenuissima, perfragili, nitida, albo-cinerea, flammis rufis depicta; anfractibus 5, quorum apicales 2 albi, stramineo—vel puniceo-tincti, spiraliter tenuilirati, cæteris tribus infra suturas deplanatis, perlævibus, ventricosulis, ultimo rapide accrescente, ad peripheriam rotundato, circa umbilicum spiraliter tornato et striatulo, umbilico ipso profundo; apertura rotunda, labro tenui, columella simplice.

Alt. 4, diam. 6 mm.

Hab. Mekran Coast; off Charbar, at 40 fathoms; off Astola Island, 90 fathoms; Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms, shell-sand.

A very fragile shell, brilliantly nacreous, green, violet, and blue iris hues mostly occurring, often collected in battered condition, the somewhat fugitive outer cuticle, showing rufous flames depicted upon a greyish ground, soon wearing away. The finest examples occurred off Charbar; it was both rare and in poor condition, and small, in the famous Gulf of Oman dredging at 156 fathoms.

Monilea chiliarches *, sp. n. (Pl. I. fig. 4.)

M. testa anguste umbilicata, turbinata, pallide albo-straminea, intus fulgide margaritacea, delicata; anfractibus 5, quorum apicalis vitreus, bulbosus, cæteris pulchre gradatis et tornatis, tribus supernis (præcipue penultimo) infra suturas radiatim sculpturatis, duabus carinis marginatis præditis, in medio, simul ac infra et supra, penultimo anfractu longitudinaliter oblique et arctissime

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* χιλιάρχης, ruler of a thousand.

fenestrato, ultimo bicarinato, infra suturas radiatim oblique decorato, carinis marginatis, apud basin spiraliter quinque-lirato, liris circa umbilicum fenestratis longitudinaliter incrassatulis; apertura rotunda, intus pulchre iridescente, peristomate tenui.
Long. 5, lat. 8 mm.

Hab. Persian Gulf.

A unique and most beautiful species. From the figure and description, so near does it appear to *Monilea tropicalis*, Hedley *, from Mast Head Reef, Queensland, that I place it in the same genus; otherwise I had considered it, perhaps, an *Eumargarita*, P. Fischer. Some authors, doubtless, would include it in *Solariella*, S. Wood, but this last is but subgeneric to *Monilea*, in my opinion.

Epitonium schepmani, sp. n. (Pl. I. fig. 6.)

E. testa late ovata, delicata, alba, vel albo-cinerea, imperforata; anfractibus 9, quorum apicales tres bicolores, nitidissimi, perlæves, cæteris ventricosis, apud suturas impressis, longitudinaliter undique lamellosis, lamellis hic illic varicosis, tenuibus, lævibus, fragilibus, anfractibus supernis arctissime lamellatis, anfractu ultimo bi- vel trivaricoso, lamellis ad 36, interstitiis inter lamellas spiraliter delicato-striatis; apertura rotunda, peristomate continuo, margine columellari incrassato.
Long. 9, lat. 4·50 mm.

Hab. Sheikh-Shuaib I., Persian Gulf.

Distinguished by its thin, shining, smooth lamellæ, which are so crowded in the two or three whorls just below the nuclear as almost to impinge upon each other. They number thirty-six upon the body-whorl, of these two or three are variced. It does not seem very akin to any of the *Scalariæ* known from the Persian Gulf region. I have much pleasure in dedicating this interesting species to Dr. M. M. Schepman, whose monograph on the Gastropodous Mollusca of the 'Siboga' expedition is memorable.

Epitonium zatrephes, sp. n. (Pl. I. fig. 5.)

E. testa oblonga, imperforata, delicata, albida; anfractibus 9, quorum tres apicales læves, nitidi, cæteris ventricosis, apud suturas impressis, lamellis tenuibus ornatis, numero anfractum ad ultimum circa 20, anfractibus supernis arctissime lamellatis, interstitiis inter lamellas pulchre et arcte striatis; apertura fere rotunda, peristomate continuo, columella paullum excavata.
Long. 9, lat. 4 mm.

Hab. Mekran Coast; off Charbar.

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* Proc. Linn. Soc. N.S.W. 1907, vol. xxxii. p. 490, pl. xvi. fig. 12.

Of the same dimensions as the last species just described, but there are no traces of varices; the characters, likewise, of the lamellæ are different, these being clearly cut, smooth, and thicker than in the fellow species. The spiral striæ are also much more fine and delicate.

There seems now no hope that the names *Scalaria* or *Scala*, which have graced this genus with such aptitude during so many years, can be preserved, unless, indeed, some of the more inexorable decrees of the law of priority be removed. Since Bolten's names are to be recognized, it will be well to ask why he called the "Wentletraps" by the harsh-sounding *Epitonium*. The name might be worse however: it is pure Greek, ἐπιτόνιον signifying the "key by which the strings of an instrument are tightened to tune it"; presumably, therefore, the chord-like close longitudinal lamellæ, tightly packed over the whorls, suggested it.

Crosseia alliciens [*], sp. n. (Pl. I. fig. 7.)

C. testa minima, anguste umbilicata, rotundo-conica, pellucida, albo-vitrea, nitida, tenuissima; anfractibus 4, apicali parvo, cæteris apud suturas impressis, ventricosulis, lævissimis, ultimo globoso, circa umbilicum concentrice fortiter exsculpto et marginato, umbilico ipso parvo; apertura ovato-rotunda, peristomate tenui, collumella excavatula.

Alt. 1·75, diam. 1·30 mm.

Hab. Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms, shell-sand.

Very minute and papyraceous; perhaps, indeed, not quite adult, but the distinguishing features of the species are all present—the umbilicar ridge, for instance, is strongly built and conspicuous. The umbilicus itself is small and narrow; whorls four, ventricose. Substance of shell glassy, thin, quite smooth throughout, and polished. The only other species yet known from the same seas is *C. eryma*, Melv. [†] This, though equally small, is a stouter shell, solid, and spirally closely striate throughout. But few possess no sculpture; such, however, is the case with *C. naticoides*, Hedley [‡], and one or two other Australian species, including also *C. glabella*, Murdoch [§], from New Zealand, and *carinata*, Hedley [||], from Port Kemble ('Thetis' Expedition), a very minute species, alt. 1·7, diam. 1·46 mm., with a blunt peripherial keel.

[*] *Alliciens*, alluring.

[†] Proc. Mal. Soc. Lond. vii. (1906) p. 70, pl. vii. fig. 7.

[‡] Rec. Australian Mus. vi. (1907) p. 290, pl. liv. figs. 6, 7.

[§] Trans. N.Z. Inst. xxxvii. (1905) p. 225, pl. viii. figs. 16, 17.

[||] Mem. Austral. Mus. iv. p. 345, fig. 71 (1903).

Teinostoma emmeles *, sp. n. (Pl. I. fig. 8.)

T. testa subrotunda, profunde et late umbilicata, solida, calcarea, alba; anfractibus ad 5, quorum 2½ apicales bulbosi, lactei, læves, cæteris arctissime spiraliter liratis, liris sub lente irregulariter rugatis, interstitiis foveolatis, ad suturas valide impressis, ultimo rotundato, lineis incrementalibus longitudinaliter accinctis, liris apud basin circa umbilicum distantibus; apertura obliqua, semilunata, peristomate subincrassato, paullum effuso, margine columellari recto, callo linguifero umbilicum obtegente.

Alt. 6, diam. 5 mm.

Hab. Persian Gulf; Henjam Island, 1906.

A most interesting species, of doubtful place and affinities. After much consideration, I began by calling it a *Cyclostrema*, but it might, owing to the obliquity of mouth, be equally thought an *Adeorbis*, while the general "facies" suggests *Eunaticina*. There are several points of agreement with *Teinostoma parvulum*, Hedley, judging from figure and description, more especially as regards the close spiral liræ uniformly covering the whole surface, and also the prolongation of the tongue-shaped varix over the umbilicus. This causes me to consider it of the same genus.

Ethalia diotrephes †, sp. n. (Pl. I. fig. 9.)

E. testa parva, alba, profunde umbilicata, solidula; anfractibus 4, quorum apicales 1½ perlæves, bulbosi, cæteris supra peripheriam omnino fere planulatis, delicatissime undique spiraliter liratulis, lirulis arctis, sub lente punctulosis, oblique radiatim decurvatis, extus marginulatis, peripheria acute carinata, subtus lirulis similiter arcte punctulosis, circa umbilicum radiatim extensis; apertura rotunda, labro extus paullum incrassato, subangulato, continuo, columella late et triangulatim supra umbilicum extensa et lingulata.

Alt. 2, diam. 3·20 mm. (sp. maj.).

Hab. Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 150 fathoms in shell-sand.

Unfortunately both the examples that have occurred of this strange species are broken; the larger especially so in the region of the mouth, the smaller, however, showing these portions more perfectly. I know no shell at all comparable; and had hoped, before attempting to describe it, that some perfect specimens would be found, but this now seems very unlikely to be the case. It is small, of thickish substance, white, four-whorled, 1½ being apical, bulbous; the umbilicus is straight-walled, deep, solarioid, but the margin, as also in *Fluxina*, is not crenulate; the surface above is closely concentrically shagreened and dotted, the periphery acutely keeled, upper whorls very slightly depressedly conical. Below, though imperfect, signs of a lingulate columellar callus can be discerned which would partially cover the umbilicus. This shell is now placed in *Ethalia* only tentatively; and I have, since description, found an imperfect, but beautifully sculptured specimen of probably the same species in shell-sand from Port Darwin, N. Australia, received from Dr. J. C. Cox.

---

* ἐμμέλης, harmonious.

† διοτρεφής, noble.

*Fluxina stenomphala**, sp. n. (Pl. I. fig. 10.)

F. testa parva, anguste umbilicata, vitrea, lactea, magnopere delicata, depresse conica, ad peripheriam acutissime carinulata; anfractibus 5, apicalibus duobus inclusis, ventricosulis, vitreis, lævibus, cæteris ad suturas canaliculatis, tornatis, supra suturas marginatis, ultimo anfractu circa peripheriam pulcherrime denticulato, apud basin lævi, circa umbilicum angustum radiato, marginato; apertura angusta, labro tenuissimo, margine columellari apud umbilicum paullulum reflexo.

Alt. 1·50, diam. 3·25 mm.

Hab. Gulf of Oman, lat. 25° 10′ N., long. 61° 34′ E.; Mekran Coast; Charbar, 40 fathoms.

This is the second *Fluxina* obtained from the Persian Gulf region: the first, a smaller species, was described under the name of *F. dalliana* †, Melv. & St., in 1903.

There have been lately introduced by Dr. Schepman two beautiful small species, dredged during the 'Siboga' expedition, *Fl. marginata* and *trochiformis*, Schep., and the latter of these has some affinity to our shell, from which, indeed, it differs in size and in the much narrower umbilicus. From this circumstance the trivial name is proposed. We may add, the beautifully denticulate margin is the same in both species, as is the general form and sculpture. It has only occurred, so far, very rarely in shell-sand.

Rissoa (*Apicularia*) *townsendi*, sp. n. (Pl. I. fig. 11.)

R. testa parva, inflata, tenuissima, alba, fragili, subrotunda; anfractibus ad 5, quorum duo apicales perlæves, albi, cæteris gradatulis, ad suturas multum impressis, ventricosis, nitidis, longitudinaliter perobliqne costulatis, costis indistinctis, superficialibus, apud

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* στενόμφαλος, with narrow umbilicus.

† Ann. & Mag. N. H. ser. 7, vol. xii. p. 298, pl. xxi. fig 2 (1903)

basin omnino evanidis, undique spiraliter striatulis; apertura rotunda, peristomate tenui, continuo, columella paullum excavata.
Long. 2·75, lat. 1·75 mm.

Hab. Karachi, 1906; Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms, shell-sand.

An inflated, gradately-whorled *Rissoa* of great tenuity, being evidently an abyssal species. It differs from *R. charope* altogether in sculpture, and also from *R. versoverana*, both these being inhabitants of the same seas. This last is a much more solidly constructed shell, more compact, of brown colour, or white flecked with brown, two forms occurring, one of which, owing to its obese body-whorl, the more approximates *R. townsendi.*

Rissoa (*Scrobs*) *elspethæ*, sp. n. (Pl. I. fig. 12.)

R. testa cylindrica, semipellucida, delicata, tenui; anfractibus 5–6, quorum apicales tumidi, ad apicem ipsum deplanati, dein bulbosi, cæteris 3½ ad suturas impressis, ventricosis, lævibus, ultimo prolongato, paullum obliquo; apertura ovata, peristomate continuo, columella obliqua.
Long. 3, lat. 1 mm.

Hab. Mekran Coast; Charbar, 40 fathoms.*

A very beautiful and delicate, though minute species, and in local abundance at the above dredging, though we have not yet discerned it from elsewhere. It is of the same form but smaller than *R.* (*Scrobs*) *columen* *, Melv., from the Gulf of Oman at 150 fathoms, and it is likewise quite smooth, the larger species being uniformly spirally striate. I have pleasure in connecting with this the Christian name of my niece Mrs. Reginald Fletcher, who has always evinced great interest in biological studies.

Rissoa (*Scrobs*) *ictriella*, sp. n. (Pl. I. fig. 13.)

R. testa attenuata, oblonga, parum nitida, pallide lirescente, tenui; anfractibus 6, quorum apicales duo, quorum apex ipse planatus, simplex, cæteris ventricosis, apud suturas impressis, undique sub lente delicatissime et obscure spiraliter striolatis, ultimo anfractu paullum prolongato; apertura ovata, labro tenui, continuo, columella fere recta.
Long. 4·75, lat. 1·50 mm.

Hab. Karachi, 1906.

A single specimen, but in my opinion possessing characters that merit differentiation. The shell is of a livid colour, smooth, not shining, microscopically delicately spirally striolate, with flattened nuclear whorls and apex, the remaining whorls decidedly ventricose. Body-whorl to some extent prolonged, mouth ovate; peristome continuous, slightly thickened.

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* Proc. Mal. Soc. Lond. vi. p. 58, pl. v. fig. 21 (1904).

Obtortio elongella, sp. n. (Pl. I. fig. 14.)

***O.* testa anguste oblonga, parva, alba, delicata; anfractibus 10, quorum 3 apicales, apice ipso parvo, rufo, lævi, deinde duobus rufo-tinctis, cæteris albis, apud suturas impressis, multum ventricosis, longitudinaliter, simul ac spiraliter, decussatim ruguloso-liratis; apertura ovata, peristomate tenui, fere continuo, columella paullum excavata.**

Long. 4, lat. 1·25 mm.

Hab. Mekran Coast, off Charbar.

A small elongate shell, narrower but of the same calibre as *Styliferina fulva* [*], Wats., which is placed by Mr. C. Hedley in his genus *Obtortio* [†], in company with *Rissoa pyrrhacme* [‡], M. & St., and the lately described *O. vulnerata*, Hedley [§]. It comes nearest to *O. fulva*, but is much the same size and contour as *O. vulnerata*.

The type of this genus was described by myself in collaboration with Mr. Standen, as has just been observed, as a *Rissoa*, and subsequently tentatively considered an *Alaba* [‖]. Later both Hedley and Dall [¶] placed it among the Pyramidellidæ, but the former author, finding the nuclear whorls non-heterostrophe, has again transferred it to the Rissoidæ.

This interesting species (*O. pyrrhacme*) I now have in my collection from Mauritius (*W. Moss*), from the Persian Gulf (*Townsend*), and Bombay (*Abercrombie*), likewise from Bydong Cays (*Haddon*), and Thursday Island, Torres Straits (*A. K. Henn*); and it appears to me not to vary at all, excepting a degree in size, from any of these places and to be quite distinct from *O. fulva* (Wats.), with which some authors are inclined to associate it.

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[*] Rep. 'Challenger' Exped. xv. p. 571, pl. xlii. fig. 5 (1886).

[†] Hedley, Moll. of Funafuti, Mem. Austral. Mus. iii. p. 412, fig. 6 (1899).

[‡] Journ. Conch. viii. 1896, p. 310, pl. xi. fig. 70.

[§] Proc. Linn. Soc. N.S.W. 1909, xxxiv. p. 439, pl. xl. fig. 52.

[‖] Journ. Linn. Soc. Lond., Zool. xxvii. p. 170 (1899).

[¶] Dall & Bartsch, Mon. W. Am. Pyramidellid Mollusks, p. 16 (1909).

Cerithium trigonostomum, sp. n. (Pl. I. fig. 15.)

C. testa parva, regulari, fusiformi, pallide ochracea vel alba; anfractibus 11, quorum apicalis perminutus, lævis, cæteris ad suturas impressis, regulariter costulatis, costis utrinque gemmulatis, ad medium spiraliter uniliratis, superficie rugosa, ultimo anfractu multilirato, præcipue ad basin, et bino gemmularum ordine ad costas infra peripheriam decorato; apertura subtrigona, labro recte effuso, obtusangulo, breviter ad basin rostrato.
Long. 6·75, lat. 2 mm.

Hab. Mekran Coast, Charbar, 40 fathoms.

A few examples only of a neat little *Cerithium*, with regularly chased whorls, there being two rows of beading on the riblets on either side of the sutures, a strong median lira dividing them. The body-whorl is well furnished with liræ below the periphery to the base. Mouth subtrigonous, outer lip somewhat angled and prominent, shortly beaked basally.

Cerithiopsis eutreta *, sp. n. (Pl. II. fig. 16.)

C. testa minuta, attenuato-cylindrica, tenui, ochro-cinerea; anfractibus ad 10, quorum apicales 3 ochracei, læves, cæteris ventricosulis, ad suturas impressis, ad medium spiraliter tribus carinulis decoratis, ultimo quatuor, infra et supra, juxta suturas, spatio intervallari præditis, quod, cum interstitiis inter carinas spirales, minute foveolatum et alveatum est; apertura ovata, labro paullum effuso, tenui, columella excavata, canali producto.
Long. 3, lat. 1 mm.

Hab. Persian Gulf, Henjam Island.

With *C. henjamensis* one specimen only of a distinct little shell occurred, its sculpture being peculiar. Ten-whorled, the three apical being smooth, the remainder thrice spirally keeled, these keels being approximate to each other; on either side between them and the sutures the surface is plain, but much pitted and honeycombed; the same alveate condition obtains between the spiral keels, of which the body-whorl possesses four, with curtly angled base, and plain; the mouth oval, columella slightly excavate.

Cerithiopsis henjamensis, sp. n. (Pl. II. fig. 17.)

C. testa parva, angusta, attenuato-cylindrica, læte ochraceo-brunnea, solidula; anfractibus ad 13, quorum apicales 3 lævissimi, vitrei, ochracei, cæteris ad suturas haud multum impressis, triplici gemmarum spiralium serie arcte præditis; anfractu ultimo quatuor similibus ordinibus decorato, apud basin angulato-planato, decurtato; apertura parva, labro tenui, columella paullum excavata, canali brevi.

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* *εὔτρητος*, honeycombed.

Long. 5, lat. 1 mm.

Hab. Persian Gulf, off Henjam Island.

A very narrow aciculate species, quite distinct from the Bombay *C. sykesii*, Melv.[*], with which, from the figure, it might easily be confounded. That is a much broader shell in proportion, and coarser in its substance and sculpture.

Three examples only, the most perfect being selected for the type.

Cerithiopsis (*Seila*) *ochrolivens*, sp. n. (Pl. II. fig. 18.)

C. testa attenuata, anguste cylindrica, solida; anfractibus ad 12, apicalibus ?, omnino spiraliter carinatis, supernis tribus, anfractu ultimo quatuor carinulis, quorum duobus suturalibus utrinque lividis, carina centrali ochraceo-tincta, ad basin curta, planata; apertura ovata, margine columellari calloso.

Long. 7, lat. 2 mm.

Hab. Karachi, 1906.

A small *Seila*, conspicuous for its ochraceous and grey colouring alternating spirally on the whorls, the spiral keels on either side of the sutures being livid, while that in the centre is ochraceous. Upon the body-whorl the two inner of the four spirals are of that hue, the outer being livid. The base is curtly flattened and deplanate, with the columellar margin very callous.

The only example of this distinct form is imperfect, and the nuclear details are therefore wanting.

Columbella (*Seminella*) *salutaris*, sp. n. (Pl. II. fig. 19.)

C. testa breviter fusiformi, nitida, parva, lævi, alba, vel stramineo-zonata; anfractibus sex, apicali parvo, cæteris gradatulis, ad suturas multum impressis, leniter lævicostulatis, superne, infra suturas, incrassatis, ultimo anfractu lævicostulato, vel, ut sæpe, costis evanidis, lævigato, ad basin spiraliter striato; apertura anguste flexuosa, labro intus denticulato, crassiusculo, columella ad medium recta, deinde curvata, canali brevi.

Long. 2·75, lat. 1·20 mm.

Hab. Bombay (*Abercrombie and Townsend*).

This is another species carved out of the miscellaneous assemblage, now known as *C.* (*Seminella*) *selasphora*, *melitoma*, *phaula*, &c., which were by a past generation considered all one species—*atomella*, Duclos. The true *atomella* is not, I believe, present in these waters, and is most probably entirely confined to the New World. No form of *atrata*, Gould, seems to coincide with *C. salutaris*.

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[*] Proc. Mal. Soc. Lond. ii. p. 109, pl. viii. fig. 8 (1896).

Mitra (*Pusia*) *geoffreyana*, sp. n. (Pl. II. fig. 20.)

M. testa parva, utrinque attenuata, breviter fusiformi, alba; anfractibus 6, quorum duo apicales bulbosi, læves, cæteris gradatulis, longitudinaliter lævicostatis, interstitiis intercostalibus etiam fere lævibus, sub lente delicatissime spiraliter striatulis, superficie hic illic sparsim brunneo vel ochro-maculata, præcipue infra suturas ad costas, simul ac labro; apertura anguste oblonga, labro tenui, columella quadriplicata.

Long. 4·50, lat. 2 mm.

Hab. Persian Gulf, off Sheikh-Shuaib Island.

Hitherto confused with *M. blanfordi* [*], M. & St., to which it bears only a very distant resemblance, this pretty little species is well differentiated by its four columellar plaits, all of equal size and similar convolution. The ochre-brown spotting on an otherwise pure white ground, principally at the point of junction of the outer lip with the body-whorl and on the summit of every third rib just below the sutures on the penultimate and body-whorls, is peculiar. The same kind of scattered blotches of colour occurs in *Elusa brunneomaculata*, Melv.[†], from the same region, but is of rare occurrence among Mollusca so far as my experience goes. The whorls are extremely gradate, costæ smooth; interstices apparently likewise smooth, but with a powerful lens most delicate spiral striation is observable. With age, however, these striæ wear off.

Terebra remanalva [‡], sp. n. (Pl. II. fig. 21.)

T. testa angusta, attenuata, albo-gilva, vel, in uno specimine, lilacino-tincta; anfractibus ad 15, quorum apicales 3 nitidissimi, perlæves, brunnei, cæteris ad suturas impressis, infra, juxta suturas, spiraliter unisulcatis, undique longitudinaliter crassicostulatis, costulis nitidis, rectis, interstitiis sub lente pulchre transversim striatis, ultimo anfractu ad medium albo-tæniato;

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[*] Proc. Zool. Soc. Lond. 1901, ii. p. 423, pl. xxiii. fig. 19.

[†] Mem. Manch. Soc. vol. xli. (1897) no. 7, p. 13, pl. vi. fig. 5.

[‡] *Remano, alvus*, refluent.

apertura oblonga, brunnescente, labro tenui, columella fere recta, canali brevi.
Long. 31, lat. 7 mm. (spec. maj.).

Hab. Persian Gulf, Bundo Abbas, and Bushire, 1906.

Allied to *T. spectabilis*, Hinds, *gouldi*, Desh., and *edgarii*, Melv. It differs from these by the very delicate interstitial transverse striolations, the narrowed somewhat straight aperture, and want of ventricosity of whorl. *T. edgarii* occurs in the same seas, and it is sometimes hard to differentiate them. I am grateful to Mr. Edgar Smith for his opinion as to their distinctness.

Mangilia ichthys [*], sp. n. (Pl. II. fig. 22.)

M. testa parva, fusiformi, delicata, albo-cinerea; anfractibus 7, apicalibus tribus inclusis, quorum duo superiores bulbosi, albolutei, læves, tertio pulchre et minute crenulato, cæteris quatuor sex-costatis, costis latis, continuis, expansis, omnibus ventricosulis, ad suturas impressis, undique pulcherrime et arctissime spiraliter tenuistriatis; apertura oblonga, labro extus perlato, sinu lato, brevi, columella fere recta, basi haud producta.
Long. 7, lat. 3 mm. (spec. maj.).

Hab. Mekran Coast, off Astola Island, 90 fathoms.

A very choice though small species, and rarely occurring in shell-sand. The examples are dead, and the coloration is therefore a matter of guesswork; it is very probably pale ashy brown in life. The ribs, six in number on each of the four lowest whorls, are continuous with each other, broadened, the upper whorls being semivitreous, the third crenulate.

The only ally we can find is *M. calcata* [†], Hedley, an equally rare species, only occurring, so far as is known, at Hope Island, Queensland. It differs in several ways, particularly in the sinus, which is not "an almost closed tube at top of a bold varix," as in *M. calcata*, but broad, short, and shallow, and not extending far towards the margin of the outer lip.

Mangilia querna [‡], sp. n. (Pl. II. fig. 23.)

M. testa parva, breviter fusiformi, pallido gilva vel straminea, solidula; anfractibus 7, quorum duo apicales tumidi, læves, cæteris

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[*] Ἰχθυς, a fish, from the fish-like ribs.

[†] Proc. Linn. Soc. N.S.W. 1909, vol. xxxiv. pt. 3, pl. xliv. fig. 90.

[‡] *Quernus*, oaken, from the colour.

apud suturas impressis, ventricosulis, perlævibus, undique longitudinaliter paucicostatis, costis crassis, nitidis, apud ultimum novem; apertura parva, ovata, labro extus crasso, nitido, ad basin truncatulo, sinu nullo, columella recta, canali brevi.
Long. 5·50, lat. 2 mm.

Hab. Mekran Coast, off Charbar, at 40 fathoms, 1900.

A thickened pale brown or straw-coloured *Mangilia*, few-ribbed, the number only extending to nine on the last whorl. Altogether it is seven-whorled, two of these being apical; the outer lip is thickened, no trace of sinus being perceptible; columella straight, canal very short.

Mangilia tetartemoris, sp. n. (Pl. II. fig. 24.)

M. testa pergracili, attenuato-fusiformi, nitida, delicata, pallide straminea; anfractibus 7, quorum tres apicales, tertio perinflato, omnibus delicate cancellatis, cæteris ad medium angulatis, longitudinaliter sex-costatis, costis remotis, regularibus, æquidistantibus, superficie omni spiraliter arcte liratula, ultimo anfractu bicarinato, carinis chordalibus; apertura angusta, oblonga, labro tenui, sinu lato, nequaquam profundo, canali paullum prolongato.
Long. 8, lat. 2·50 mm.

Hab. Mekran Coast, off Astola Island, at 90 fathoms.

A remarkably graceful shell, conspicuous for its strong yet thread-like angled keels, one upon the upper whorls, two on the lower, while a rectangular appearance is obtained by the six longitudinal remote yet regular ribs on each whorl, these not being exactly continuous, as is the case with the sculpture of some *Mangiliæ*; the apical whorls are beautifully cancellate, colour of the remainder pale ochreous or straw-colour, slightly intensified on the ribs. The spiral lines crossing the whorls are close and uniform. Sinus broad, but shallow. Mouth narrowly oblong, canal slightly prolonged.

An alliance with other handsome forms from the same region, e. g. *M. townsendi*, Sowb., *galigensis* and *o'maleyi*, Melv., is to be noticed. To the last of these it bears closest resemblance—indeed, at first I considered them identical; but the quadrate sculpture is peculiar to *M. tetartemoris*, which derives its specific name from this distinctive attribute.

Pleurotomella rhytismeis *, sp. n. (Pl. II. fig. 25.)

P. testa perparva, alba, breviter fusiformi, compacta; anfractibus 6, quorum duo apicales bulbosi, læves, cæteris ad suturas multum

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* *ῥυτίς*, a wrinkle.

impressis, apud medium fortiter acute angulatis, undique costulis obliquis decoratis, spiraliter fortiter rudiliratis, ultimo anfractu etiam apud peripheriam fortiter angulato, et deinde ad basin liris spiralibus, numero novem, prædito; apertura ovata, labro extus ad medium angulato, columella fere recta.

Long. 3, lat. 1·50 mm.

Hab. Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms.

Allied to other *Pleurotomellæ* from the same locality—e. g. *P. nereidum*, *amphitrites*, *eulimenes*, &c.; but differing from all in its compact abbreviated-fusiform contour, wrinkled sculpture, and coarse median angulation. The spiral liræ, too, are coarse and pronounced, proportionately speaking.

Donovania tomlini, sp. n. (Pl. II. fig. 26.)

***D.* testa crassa, breviter et obtuse fusiformi, solidula, ochraceo-brunnea vel fere nigra; anfractibus 6–7, apice ipso perobtuso, crasso, interdum quasi-immerso, cæteris longitudinaliter crassicostatis, interstitiis intercostalibus lævissimis, apud suturas impressis, paullum ventricosis, ultimi costis anfractus numero ad 18, ad basin spiraliter crassiliratis; apertura anguste ovata, labro effuso, columella fere recta, canali brevissimo.**

Long. 3, lat. 1 mm.

Hab. Persian Gulf, Henjam Island.

A good many specimens, collected together in 1906, showing the species to be gregarious, if local. Superficially it resembles *Cer. tubercularis*, Mont., or a *Bittium*, the colour varying from ochre-brown to almost black. Thick in substance, the apical whorls sometimes appearing almost immersed, causing the small longitudinal ribs of the third whorl to stand out, just as if placed at the summit of the shell, while in other examples the apex shows more distinctly and normally. The aperture is narrowly oval, outer lip effuse, columella almost straight, canal very short. With it occurred *Pyrgulina callista*, Melv., and a small *Triphora*.

This is the second *Donovania* recorded from these seas. The first was described under the name of *Lachesis bicolor*, Melv.* It gives me much pleasure to name it specifically after Mr. J. R. le Brockton Tomlin, who is devoting much time to the study of the smaller Mollusca.

Turris invicta, sp. n. (Pl. II. fig. 27.)

***T.* testa breviter conico-fusiformi, turrita; anfractibus ad 14,**

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* Mem. Manch. Soc. vol. xlii. part 2, no. 4 (1898), p. 14, pl. i. fig. 17.

quorum apicalis ipse bulbosus, pervitreus, duo hinc proximi vitrei, arcte longitudinaliter costulati, tertius unicarinatus, carina crenulata, cæteris apud suturas impressis, spiraliter tornatis, bicarinatis, carinis regulariter brunneo-maculatis et lineatis, interstitiis arcte spiraliter liratis, albis, ultimo anfractu multilirato, ad peripheriam fortiter bicarinato, carinis, præsertim superiore, regulariter brunneo-maculatis, liris omnibus simili modo ad basin brunneo-lineatis; apertura ovata, labro tenui, sinu conspicuo, columella recta, canali prolongato.

Long. 32, lat. 6 mm.

Hab. Persian Gulf.

Of this fine addition to the Pleurotomidæ I have only seen the type specimen, but am informed that others have been found. This is in very perfect condition, and belongs to the typical section of the genus, which has been compelled to have its well-known generic name *Pleurotoma*, Lam., 1799, altered, owing to one year's priority of *Turris* only. It perhaps most resembles the larger and more elongate *T. marmorata*, Lam., but the abbreviate form distinguishes it at a glance from both this and other allies. I am especially indebted to Mr. G. B. Sowerby for first calling my attention to this species.

Retusa turrigera, sp. n. (Pl. II. fig. 28.)

R. testa abbreviato-cylindrica, tenui, alba vel pallide straminea, spira gradata; anfractibus 4, quorum apicalis parvus mamillatus, subvitreus, cæteris turrigeris, lævibus, parum nitidis, ultimo interdum ad medium constrictulo, interdum normali; apertura ovata, subtus latiore, labro fere recto.

Long. 2·75, lat. 1·25 mm.

Hab. Persian Gulf, Mussandam.

A compact species, the whorls angularly turreted above, quite smooth, dull white or straw-coloured, the mouth widened basally, ovate; outer lip sometimes, with basal whorl, constricted in the centre, at other times quite normal and straight. We do not know a near ally, at all events in this fauna.

Lepton orientale, sp. n. (Pl. II. fig. 29.)

L. testa subæquilaterali, percompressa, explanata, tenui, alba, subpellucente, superficie delicate sed irregulariter concentrice striata, striis sericatulis, umbonibus prominulis, approximatis, margine dorsali antice paullum excavato, ventrali propo recto, pagina interna albo-lactea, cardine normali.

Alt. 3, diam. 4 mm.

Hab. Gulf of Oman, lat. 24° 58′ N., long. 86° 54′ E., 156 fathoms, shell-sand.

A few valves of a small *Lepton*, not unlike in form to the British *L. squamosum*, Mont.

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. *Cyclostrema tredecimlineatum.*
Fig. 2. —— (*Tubiola*) *nugatorium.*
Fig. 3. *Solariella iridifulgens.*
Fig. 4. *Monilea chiliarches.*
Fig. 5. *Epitonium satrephes.*
Fig. 6. —— *schepmani.*
Fig. 7. *Crosseia alliciens.*
Fig. 8. *Teinostoma emmeles.*
Fig. 9. *Ethalia diotrephes.*
Fig. 10. *Fluxina stenomphala.*
Fig. 11. *Rissoa* (*Apicularia*) *townsendi.*
Fig. 12. —— (*Scrobs*) *elspethæ.*
Fig. 13. —— (——) *ictriella.*
Fig. 14. *Obtortio elongella.*
Fig. 15. *Cerithium trigonostomum.*

Plate II.

Fig. 16. *Cerithiopsis eutreta.*
Fig. 17. —— *henjamensis.*
Fig. 18. —— (*Seila*) *ochrolivens.*
Fig. 19. *Columbella* (*Seminella*) *salutaris.*
Fig. 20. *Mitra* (*Pusia*) *geoffreyana.*
Fig. 21. *Terebra remanalva.*
Fig. 22. *Mangilia ichthys.*
Fig. 23. —— *querna.*
Fig. 24. —— *tetartemoris.*
Fig. 25. *Pleurotomella rhytismeis.*
Fig. 26. *Donovania tomlini.*
Fig. 27. *Turris invicta.*
Fig. 28. *Retusa turrigera.*
Fig. 29. *Lepton orientale.*

II.—*Descriptions and Records of Bees.*—XXX.

By T. D. A. Cockerell, University of Colorado.

The present part is wholly devoted to Australian Prosopididæ. After studying a long series of species of *Meroglossa* and *Palæorhiza*, it becomes evident that the latter is at best a subgenus. An examination of the mouths brings out the remarkable fact that the males have pointed (dagger-like) tongues, while those of the females are broad and obtuse, as in *Prosopis*. Thus the acute and obtuse-tongued bees are united in a single genus! Another noteworthy feature is a comb on the first two joints of the maxillary palpi. The females apparently eat pollen; at least the tongues of *Meroglossa parallela* (Ckll.), *M. penetrata percrassa* (Ckll.), and *M. melanura* (Ckll.) are full of it. According to Perkins, *Prosopis* also eats pollen*.

Meroglossa eucalypti, sp. n.

♂.—Length about 9 mm.

Black and red, with very pale yellow markings; head black, the cheeks obscurely reddish; vertex rough and densely punctured; front with a median raised line and on each side of it a broad smooth shining area, rounded and sharply defined above; clypeus very prominent, with a very broad deep sulcus or excavation on each side, a deep trough running down each side of the face; face of clypeus shallowly transversely concave; face below antennæ pale yellow, except the supraclypeal area and the inner, almost hidden, part of the lateral sulci; lateral marks extending upward as broad bands nearly to level of top of smooth frontal areas, and ending very obtusely; labrum and mandibles ferruginous; yellow colour extending across malar space and as a band halfway up posterior orbital margins; scape swollen, sausage-shaped, bright ferruginous; flagellum ferruginous, infuscated above, except the last joint; thorax strongly and quite closely punctured, black, with most of the prothorax, and the mesothorax except some blackish suffusion posteriorly (extending about to middle sublaterally), ferruginous; tubercles, small subquadrate spot behind, axillæ, and two large but widely separated spots on scutellum all cream-colour; area of metathorax triangular, rough and longitudinally strigose, contrasting with the adjacent sides of metathorax, which are covered with greyish-white hair; tegulæ dark reddish fuscous, with a cream-coloured spot. Wings clear, nervures dark fuscous, stigma ferruginous, with a dark margin; first r. n. joining first t.-c. Legs dark reddish, with glittering hairs, small joints of tarsi becoming clear ferruginous; anterior and middle femora short and thick. Abdomen well punctured, chestnut-red and fuscous, the first segment fuscous, base and apex of second and third suffusedly fuscous; apex broad,

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* Another pollen-eater is *Pseudomasaris vespoides* (Cresson), as was observed by my wife at Pecos, New Mexico. The pollen eaten is that of *Pentstemon*.

with long projecting bristles; ventral segments 3 to 5 ciliated with white hair.

♀.—Similar to the male, but the thorax is without red and the abdomen is either all black or with obscure reddish bands across the middle of the third and following segments; the head also is quite different, being red, strongly suffused with black above, without light markings, and normal in form, without facial excavations; the scape also is ordinary. The tongue is broad and obtuse, *Prosopis*-like; that of the single male has not been extracted, but it is doubtless pointed. The hind spurs are simple, black tipped with white; the mandibles are obtusely bidentate.

Hab. Mackay, Queensland (*Turner*). British Museum.

Both sexes from flowers of *Eucalyptus*, March 1900 (no. 454); ♀ at flowers of *Rosa*, April 1899; one ♀, May 1900.

Meroglossa sculptissima, sp. n.

♂.—Length about 9 mm.

Similar to *M. eucalypti*, with the same modification of the face, but differing thus:—clypeal prominence broader than long (longer than broad in *eucalypti*); scape more swollen and with a blackish mark; lateral face-marks pointed above; malar space black, but a yellowish-white stripe on lower part of cheeks; light markings of thorax chrome-yellow, the scutellum all yellow, and the postscutellum yellow except at sides (suture between them black); thorax and abdomen black without red; venation paler; legs black; apical bristles of abdomen shorter and finer.

♀.—Like the same sex of *M. eucalypti*, but the thoracic markings differing in colour and form as in the male; first r. n. entering second s.m. (as it does also in the female of *eucalypti*); head black, with the region about the mouth dark reddish; narrow lateral face-marks, creamy white, extending from about level of antennæ to that of lower end of eye; apical part of clypeus depressed; tongue *Prosopis*-like.

Hab. Mackay, Queensland (*Turner*, 1049). Male at flowers of *Eucalyptus*, 1900; females at flowers of *Cassia* (Dec. 1899) and *Rosa* (June 1900). British Museum.

Meroglossa lactifera, sp. n.

♂.—Length about 11 mm.

Shining black, with creamy white markings on head, thorax, and legs; closely similar to *M. penetrata percrassa*, but differing thus:—less robust, the abdomen especially narrower;

face narrower, not excavated; clypeus light except a broad black stripe down each side, and linear apical margin; supraclypeal light mark emarginate above, shaped rather like the hoof of a deer; lateral marks long and narrow, ending in a point above, at about level of lower side of middle ocellus; labrum with a large light patch and a dot on each side of it; mandibles dark; scape black, rather thick but not swollen; flagellum obscurely brownish beneath toward the end; as in *percrassa*, the prothorax has two light marks above (but they are shorter), the tubercles are largely light (the light area, however, notched behind), and the tegulæ have a light spot, but there is no light spot behind tubercles; ocelli much smaller and in a triangle (large and in a curved line in *percrassa*); mesothorax shining, with well separated punctures (more densely punctured in *percrassa*); axillæ and post-scutellum wholly black, but scutellum with a broad median creamy-white band, narrowing posteriorly; area of metathorax larger than in *percrassa*, with a very prominent transverse ridge. Apical half of wings distinctly smoky; nervures strong and dark; b. n. meeting t.-m. (falling short of it in *percrassa*); first r. n. entering second s.m. very near base (at least twice as far from base in *percrassa*); second r. n. going beyond end of second s.m. (entering it near end in *percrassa*). Hind spurs strongly curved (longer and little curved in *percrassa*). Second abdominal segment very sparsely punctured on disk, its extreme base with appressed white hair; ventral surface of thorax with much white hair; second ventral segment of abdomen covered with white hair, the following ones with dark fuscous or black. The type specimen carries several pollen-bodies of an Asclepiad attached to its mouth.

♀.—Similar to the male, with the same peculiar venation; face broader, the markings reduced to three linear stripes, the supraclypear mark broader than upper part of clypeal stripe; prothorax with a pair of cuneiform white marks above; tubercles black, with a variable small light spot; tegulæ with a hardly perceptible spot; scutellar mark reduced to a small triangle on anterior middle. The legs are black, without light markings, whereas in the male the anterior and middle femora have large light marks, the anterior tibiæ are light in front, and the other tibiæ carry apical and basal spots.

Hab. Mackay, Queensland, May 1900, both sexes (*Turner*, 1048); also a female from Cairns, "Kur. 1. 02" (*Turner*). British Museum.

Meroglossa penetrata percrassa (Ckll.).

♂.—Similar to the female, but face deeply channelled on each side as far down as middle of clypeus; clypeus with a very broad median cream-coloured stripe; a triangular supraclypeal mark, sharply pointed above; linear lateral face-marks, beginning near level of middle of clypeus, gradually broadening above, ending a little above level of middle of front; scape black, swollen; flagellum ferruginous beneath; thoracic markings as in female, but clypeal mark reduced to a triangle on posterior margin. Legs without light markings, but anterior tibiæ largely ferruginous in front; venter with scanty pale glittering hair, apical dorsal segments with black. Wings clear.

For other characters see under *M. lactifera.*

Hab. Mackay, Queensland (*Turner*, "273 ?"), May 1899, at flowers of *Xanthorrhœa.*

Meroglossa turneriana kurandensis (Ckll.).

A male from Cooktown, Oct. 1902, has legs marked as in true *turneriana*, and supraclypeal mark wholly wanting. The metathorax and hind femora and tibiæ are shining lilac.

This was collected by Mr. Turner, and is in the British Museum.

Meroglossa turneriana viridimutans, subsp. n.

♀.—Like the same sex of *M. turneriana* (Ckll.), with no light markings on face, but Prussian green instead of blue, with lilac tints here and there (variable) on face, thorax above, and first abdominal segment; the hind tibiæ, seen from behind, are shining purple.

This has a distinct appearance, but is only a local race; some females of *M. turneriana* from Mackay have the thorax green.

Hab. Port Darwin, Nov. and Dec. 1902 (*Turner*). British Museum.

A series of male *M. turneriana* obtained by Mr. Turner at Mackay and (one specimen) Cairns shows considerable variability in colour. Some have the thorax strongly suffused with lilac, and the vertex may be entirely green. The Mackay specimens were taken in August, January, February, and March. The species shows the usual *Meroglossa* dimorphism in the tongue.

Meroglossa baudinensis (Ckll.).

The tongue of *Prosopis baudinensis* has not been examined, but from its evident affinities the insect must be a *Meroglossa*.

A new locality is Port Darwin, Dec. 1902 (*Turner*).

Meroglossa reginarum (Ckll.).

The male closely resembles the female, but the face is narrower. The wings are quite conspicuously dusky and the tubercles are with or without a small light spot.

Taken by Mr. Turner at Mackay, April 1900, at flowers of *Xanthorrhœa*. (No. 621.)

Meroglossa perviridis cassiæfloris, subsp. n.

♀.—Length a little over 10 mm.; expanse about 18.

Agrees with *perviridis* in nearly all respects, but larger, with all the light markings creamy white and the flagellum dark, faintly brownish beneath. It is very like *M. reginarum*, but averaging a little larger and more robust, and easily separated by its green colour and perfectly clear wings.

Hab. Mackay, Dec. 1899, at flowers of *Cassia* (*Turner*, 270). Also two collected May 1900. British Museum.

The original type of *reginarum* was numbered 270, but in the present collection *reginarum* is 621.

Meroglossa luxuriosa, sp. n.

♀.—Length about 12 mm.; expanse 18½.

Brilliant green, at first sight similar to *M. perviridis cassiæfloris*, but easily separated as follows:—Face broader; creamy white face-markings reduced to a narrow band along each eye and a spot between antennæ; no light stripe along posterior orbits; mesothorax dullish, densely punctured; scutellum much more closely punctured; middle of area of metathorax rugose. Legs without light markings. Wings distinctly dusky, especially in apical field.

This is in reality nearest to *M. varicolor*, from which it differs by being larger, without the varied rose-purple tints (the face is often flushed with purple), while the border of the prothorax is wholly green. The thorax is entirely without light markings.

♂.—Similar to the female, but smaller and more slender; yellower green; face narrower, with a cream-coloured triangle on apical part of clypeus; mandibles with a cream-coloured stripe and labrum with a small spot; scape with a minute pale line; posterior orbits not striped; thorax without light markings; area of metathorax strongly purple, rugose in middle; apex of abdomen with a pair of minute contiguous spines.

Hab. Cairns, Queensland (*Turner*). British Museum. "Kur., 2. 02, 3. 02, and 4. 02."

The tongue shows the same sexual dimorphism as in the other species.

Meroglossa perkinsi, Ckll.

♂.—Length about 7½ mm.

Resembling the female, except as follows:—Face narrower, the three light bands occupying much more space, so that the face below the antennæ may be said to be light, with a broad dark band extending from each antenna down the sides (not quite to the apex) of the clypeus; scape light in front; tubercles, upper border of prothorax narrowly, and a large triangle on each side light; mesothorax with scarcely visible traces of two pale lines; scutellum and postscutellum each with a conspicuous light band on each side, the scutellar bands also projected forwards as a slight pale line on posterior lateral edge of mesothorax; a broken light band on pleura, extending backward from tubercles. These light markings are reddish in the specimen described, but apparently altered from yellow by cyanide.

One specimen from Cooktown, Nov. 1902 (*Turner*). British Museum.

Meroglossa varicolor eboracina, subsp. n.

♂.—Metallic Prussian green, similar to *M. varicolor*, but face-marks greatly developed, the face below antennæ all light except linear clypeal sutures, and a small triangle below each antennal socket; supraclypeal mark extending as a band up to middle ocellus; a broad light stripe along posterior orbital margins; tubercles, a square spot behind, and a small spot below light, as also upper border of prothorax; scutellum with a broad light stripe on each side, and a fine line, interrupted in middle, along hind margin; postscutellum light, with a broad basal green triangle. Wings dusky. The last three ventral segments have erect dark fuscous hair.

Hab. Cape York, May 1902 (*Turner*). British Museum.

M. varicolor from Mackay, Dec. 1900 (*Turner*), ♂, has the scape white in front (it is dark in ♂ *reginarum*) and head and thorax with much rose-purple colour.

Meroglossa denticauda, sp. n.

♂.—Length about 11 mm.; expanse 17½.

Head and thorax black, with bright chrome-yellow marks; abdomen piceous, with a broad suffused red band on first segment and a red suffusion at bases of second and third and an oblong pale yellow mark on each side of second; face narrow, inner orbital margins with a strong double curve; front densely and coarsely punctured; face below antennæ all deep chrome-yellow, except an elongate cuneiform brown mark on each side of clypeus, very narrow lower edge of clypeus, and a narrow black border round supraclypeal mark: supraclypeal mark extending upwards as a band to middle ocellus; lateral marks extending upwards as bands along orbits, gradually narrowing to a point at level of lateral ocelli; malar space black; posterior orbits bounded by a yellow band, failing below; labrum and mandibles each with a yellow spot; scape slender, yellow in front and reddish behind; flagellum dark above, dull yellowish beneath, except the fourth antennal joint, which is dark; mesothorax very densely, strongly, and coarsely punctured, reddish black, with a pair of very narrow dull yellow lines, not reaching anterior or posterior margins, and a slight yellow mark on each side above tegulæ; upper border of prothorax, tubercles, band (dull) on pleura extending downwards from tubercles, scutellum (except a median brown line), and postscutellum all yellow; area of metathorax strongly fluted and with a yellowish mark on each side; femora dark reddish, the middle pair quite bright red behind; tibiæ and tarsi yellow, suffused with reddish; hind tibiæ with the basal two-fifths canary-yellow and the rest light ferruginous; tegulæ subhyaline, with a yellow spot. Wings strongly orange-tinted, stigma and nervures amber-colour; b. n. falling barely short of t.-m.; first r. n. entering apical corner of first s.m.; second r. n. reaching second s.m. a short distance before the apex; second s.m. about as broad above as below; abdomen finely punctured; apex with two triangular teeth, forming a **W** margin, and laterally with well-developed dark cerci, minutely hairy at end. The tongue of the unique type male has not been extracted, but the insect is evidently a *Meroglossa* related to *M. melanura* (Ckll.).

♀.—Similar to the male, but differing as follows:—Face equally narrow, but the markings reduced to three narrow stripes, extending its whole length from the level of the anterior ocellus; labrum and mandibles not light-spotted; scape ferruginous; thoracic markings the same, but stripe below tubercles reduced to a small spot, and a small spot behind tubercles, and the scutellum without a dark line; abdomen black, with two red spots on first segment, a transverse yellow mark on each side of second, and two large transverse marks on third in the subdorsal region; legs coloured as in the male.

Hab. Mackay, Queensland (*Turner*). British Museum.

The male is no. 695, Feb. 1892; the female no. 404, May 1900.

Prosopis serotinella (Ckll.).

I am indebted to Mr. R. E. Turner for three females from Mackay, two from flowers of *Cassia*, Dec. 1899, one from *Eugenia*, Nov. 1899. In the original type of *Prosopisteron serotinellum* it appeared that the stigma was enormously enlarged, invading the whole of the marginal cell; but the new specimens clearly show that this was merely due to extreme infuscation, as the stigma can be seen with its usual boundary, the marginal cell beyond in the *Cassia* specimens being very distinctly paler. The mouth-parts are those of *Prosopis*; the maxillary blade is very broad, broadly rounded apically, with many bristles, not suddenly narrowed in the apical region as it is in the European *P. confusa*. (The American *P. asinina* is intermediate between *P. serotinella* and *P. confusa* in regard to the maxillary blade.)

The name *Prosopisteron* cannot have more than subgeneric or sectional value.

Prosopis chrysaspis, Ckll., var. *a*.

♀.—Flagellum dark; nervures and stigma piceous.

Hab. Victoria (*C. F.*). Turner Collection, British Museum.

Prosopis nubilosa, Smith.

Victoria (*C. F.*). Turner Collection, British Museum.

Prosopis nubilosa subnubilosa, subsp. n.

♀.—Lateral face-marks broader, touching supraclypeal area; no distinct dark cloud in apical region of wing; first r. n. entering extreme base of second s.m.

Hab. Mackay, May, 1900 (*Turner*, 271).

Prosopis eugeniella, sp. n.

♀.—Length 3½–4 mm.

Black, very minutely punctured, with the following parts cream-coloured: bow-shaped lateral face-marks, going a short distance above antennæ, mandibles except apex, sometimes two short lines on upper border of prothorax, spot on tegulæ, knees, anterior tibiæ in front, middle tibiæ except a large dark mark behind, and basal half of hind tibiæ. Tarsi yellowish white, with the small joints becoming reddish; flagellum ferruginous beneath. Wings clear, iridescent, the large stigma and the nervures brown; first s.m. very long, receiving first r. n. near its apex. Runs in my table to 33, and may there be easily separated by its minute size.

Hab. Mackay, Nov. 1899, at flowers of *Eugenia*, four ♀s (*Turner*, 862); also one, Nov. 1893. Three are in British Museum; two in my collection, thanks to Mr. Turner.

(The numbers cited in this and other cases refer merely to the specimens before me. Of many of the species I saw long series in Mr. Turner's collection when at the British Museum last year.)

Prosopis microphenax, sp. n.

♂.—Length slightly over 4 mm.

Black, very minutely punctured, with pale lemon-yellow clypeus, labrum, and large cuneiform lateral marks, the last broadly truncate above at lower level of antennal sockets, which produce a concavity in the edge of the yellow; no supraclypeal mark; mandibles obscurely pallid; tubercles pale edged; flagellum dull ferruginous beneath; tegulæ dark brown; nervures and stigma brown; tarsi, anterior tibiæ in front, and basal third of hind tibiæ light; middle tibiæ short and black; area of metathorax shining, superficially like *P. eugeniella*, but the venation is quite different; the wings also are dusky at the apex. The second s.m. is large, broader than high, and the first r. n. joins the first t.-c.; in *eugeniella* the second s.m. is much higher than broad. The mesothorax is more coarsely roughened than in *eugeniella*, and it and the dark parts of the head are a pure black, whereas these parts in *eugeniella* are seen by comparison to be a greenish black.

Hab. Mackay, March 1900 (*Turner*). British Museum.

This runs to the same place in the table as *eugeniella*.

Prosopis microphenax, Ckll., var. *a*.

♂.—Length almost 5 mm.

Tubercles broadly yellow, with a dark dot; postscutellum with a small yellow spot. This runs in the table next to *P. frederici*, var., but is easily separated by the small size and black scutellum.

Hab. Mackay, December 1899, at flowers of *Cassia* (*Turner*). British Museum.

Prosopis infans, sp. n. (*microphenax*, var.?).

♂.—Length 4 mm. or slightly over.

Black, similar to *P. microphenax*, but face narrower; mesothorax more minutely punctured (not so rough); scutellum with a large light central patch, postscutellum with a small mark; first r. n. joining first t.-c. as in *microphenax* type (in *microphenax* var. *a* it enters base of second s.m.).

This is perhaps only a variety of *P. microphenax*.

Hab. Mackay, Jan. 1900 (*Turner*). British Museum.

Runs in the table to 52, where it is separated by its small size.

Prosopis constrictiformis, sp. n.

♂.—Runs to *P. constricta* in table, and is only a little over 4 mm. long, with the abdomen dark beyond the base of the third segment. It is easily separated from *constricta* by the much larger punctures of the mesothorax, and by the character of the metathorax, which has the enclosure triangular and strongly ridged, and has no strong lateral keels. The pleura has very large well-separated punctures, whereas in *constricta* it appears minutely roughened. The antennæ are long; the scape in front and the flagellum beneath bright ferruginous. First r. n. entering extreme base of second s.m.

Hab. Cooktown, Oct. 1902 (*Turner*). British Museum.

Prosopis nigropersonata, sp. n.

♀.—Length about 7 mm.

Robust, head and thorax black, abdomen dark steel-blue; head without light markings; the thick upper margin of prothorax, and the tubercles, bright orange, but the rest of the thorax dark; legs black, with scanty short silvery hairs; clypeus sericeous, sparsely and feebly punctured; flagellum ferruginous beneath; mesothorax and scutellum densely and strongly punctured; pleura strongly punctured; area of metathorax broad-triangular, shining, strongly irregularly wrinkled; sides of metathorax with short white pile; tegulæ black. Wings clear, nervures and stigma dark brown; second s.m. long, very much broader than high, receiving first r. n. at its extreme basal corner; abdomen short, very finely punctured. Runs in the table to 12, and runs out on account of the medium size and black face.

Hab. Mackay, March 1892 and Dec. 1900 (*Turner*, 854). British Museum.

Prosopis cyanophila, sp. n.

♂.—Length about 6 mm.

Slender, head and thorax black, abdomen dark steel-blue; face below antennæ entirely deep lemon-yellow, the upper edge of the yellow straight, except in the middle, where the supraclypeal mark projects in the form of a triangle; mandibles red at apex; scape yellow in front; flagellum bright ferruginous beneath; front densely punctured; mesothorax and scutellum finely and closely punctured; upper border of prothorax and tubercles bright lemon-yellow, no other yellow on thorax; area of metathorax coarsely tuberculate, its lateral margins with more or less of a double curve; tegulæ piceous. Wings clear, faintly dusky apically, stigma and nervures dark brown; second s.m. very broad, receiving first r. n. a short distance from its base. Legs brownish black, anterior tibiæ yellow in front, hind tibiæ with a cream-coloured spot beneath at base; basitarsus cream-coloured, brown at apex, small tarsal joints brown; abdomen elongate, very finely punctured, no ventral tubercles. Runs in table to same place as *P. nigropersonata*, but cannot be its male, the thoracic sculpture being very much finer.

Hab. Mackay, March 1900 (*Turner*, 335). Brit. Museum.

Prosopis xanthopoda, sp. n.

♀.—Length about or nearly 6 mm.

Black, head and thorax very finely punctured; lateral face-marks broad, deep chrome-yellow, sharply pointed below, truncate above, some distance above antennæ; scape with a yellow stripe in front; flagellum very short, ferruginous beneath; swollen upper border of prothorax, and tubercles, the two uniting, brilliant orange; no other yellow on thorax; area of metathorax shining, coarsely irregularly wrinkled; tegulæ brown. Wings hyaline, nervures and stigma brown; second s.m. large, about as high as breadth at base, receiving first r. n. at basal corner. Legs black, with apical third of anterior femora, whole of middle and hind femora, except extreme base, anterior and middle tibiæ except some brown at apex, and whole of hind tibiæ, bright orange-yellow; abdomen short and broad, very finely punctured. Runs in table to *P. amicula*, Sm., which it greatly resembles, differing at once, however, by the remarkable colour of the legs.

♂.—Similar to the female, but rather less robust (though more robust than ♂ *primulipicta*); face below antennæ smooth, entirely yellow, the yellow at sides extending upwards in the form of a hand with the index finger pointed, and in the middle line as a low triangular (supraclypeal) projection, truncate apically; scape a little swollen, entirely bright yellow; legs yellow except the trochanters, coxæ, and hind femora, which are black, the hind femora having a small yellow spot at apex; first r. n. entering extreme corner of first s.m.; third ventral segment of abdomen with a pair of small tubercles, but no ridge between.

Hab. Victoria, 2 ♀, 1 ♂ (*C. F.*). Turner Collection, British Museum.

The male runs near to *P. bituberculata*, Sm., and *bidentata*, Sm., but is easily separated by the entirely yellow tibiæ and tarsi.

Prosopis cassiæ, sp. n.

♀.—Length about 8 mm.

Robust, red and black, with cream-coloured markings on head and thorax; head and thorax strongly punctured, the punctures of mesothorax very large, irregularly placed, well separated; head large, red, with broad (semicircular in outline) dull yellow lateral marks on face; antennæ red, the flagellum dusky above toward apex; tongue as in *Prosopis*; thorax black, with two marks on prothorax above, tubercles, small crescent behind, scutellum (except anteriorly, where the pale colour is trilobed by the sublateral incursion of the black) and postscutellum (except sides) all cream-colour; legs dark, the anterior tibiæ clear ferruginous in front; tegulæ dark rufo-fuscous, with a small white spot in front. Wings clear, nervures and stigma brown; b. n. falling short of t.-m.; first r. n. meeting first t.-c.; second r. n. joining second s.m. near apex. Abdomen dark chestnut-red with a faint purplish lustre; first segment quite dark, with a subapical red band; venter blackish.

Hab. Mackay, Queensland (*Turner*, 861). Brit. Museum. At flowers of *Cassia* (Dec. 1899), *Eugenia* (Nov. 1899), and *Xanthorrhœa* (April 1899).

Differs from all other species by its red head and abdomen, light face-marks, and cream-coloured thoracic markings.

Prosopis amata, Ckll.

Mackay, Queensland, March 1900 (*Turner*, 1050).

Prosopis pachygnatha, sp. n.

♀.—Length 8½ mm.

Runs in my table of Australian *Prosopis* to 19, and runs out because lateral face-marks are roughly foot-shaped, the clypeus has dense punctiferous grooves, and the mesothorax is strongly and very densely punctured, though not so coarsely as in *P. amata*. The light markings are lemon-yellow, not deep orange as in *P. amata*. Head and thorax black, abdomen dark shining purple; no light markings on head except the long subtriangular lateral marks, which are variable in size; scape black; flagellum ferruginous beneath; tongue normal for *Prosopis*; mandibles broad and thick, tridentate; the yellow marks on thorax consist of upper border of prothorax (interrupted in middle), tubercles, a broad but rather short transverse stripe on hinder part of scutellum, and a subquadrate patch on postscutellum; area of metathorax coarsely ridged; tegulæ piceous. Wings hyaline, stigma and nervures reddish brown; b. n. arched, falling short of t.-m.; first r. n. entering apical corner of first s.m.; legs black, the tarsi conspicuously pale-haired; abdomen delicately punctured.

Hab. Cooktown (type locality), Oct. 1904 (*Turner*); Mackay, May 1900 (*Turner*). British Museum.

Prosopis alcyonea, Erichs., ♂.

Cumberland, New South Wales (*Turner*). Brit. Museum.

Prosopis disjuncta, Ckll.

This is not a *Meroglossa*; the tongue is Prosopiform in both sexes. The female, hitherto undescribed, resembles the male, but the clypeus is without light colour, and the legs are without yellow markings. Females are Turner's 1051, from Mackay; three, Nov. 1899, are from flowers of *Eugenia*. Both sexes are from flowers of *Xanthorrhœa*, May 1899. In my table ♀ *disjuncta* runs to *P. albonitens*, from which it is easily separated by its larger size.

Prosopis amiculiformis, Ckll.

This species was described from the female. The male (Mackay, April and May 1900, one at flowers of *Xanthorrhœa*; *Turner*, 620), runs in my table to *P. primulipicta*, differing thus:—

Larger; face pale yellow, lateral marks ending in a point about halfway between level of antennæ and top of eye	***amiculiformis.***
Smaller; face deeper yellow, lateral marks not going nearly so far up (Mackay, May 1900; *Turner*, 714).	***primulipicta.***

The face of male *amiculiformis* is shining, and the scape has a yellow mark in front; the anterior and middle tibiæ are yellow in front, and the hind tibia is yellow at base. A female *amiculiformis* is from flowers of *Eucalyptus.*

Prosopis constricta, Ckll.

Mackay, May 1899, at flowers of *Xanthorrhœa* (*Turner*).

P. subplebeia, Ckll., and *P. coronata*, Ckll., were taken by Turner at Mackay, November 1891. A small example of *P. constricta* (Mackay, Nov. 1891) has clear ferruginous tegulæ, but it is evidently only a variety.

III.—*Notes on Amphipoda.*

By ALFRED O. WALKER, F.L.S., F.Z.S.

Stenothoë validus, Dana.

IN 1853 Dana described the above species from Rio Janeiro as having the second joint of the third peræopods expanded like that of the fourth and fifth pairs, instead of linear as in the first and second. Since that time about twenty other species have been added to the genus, but without an exception, so far as is known, these have the second joint of the third peræopods narrow or linear. In the Amphipoda Gammaridea of 'Das Tierreich' this feature forms one of the characters of the genus, an exception being made in favour of *S. validus.* The question therefore arises, Did Dana make a mistake in stating that the joint in question was similar to that of the next two pairs? It should be borne in mind that this joint can only be seen by removing the large side-plate of the fourth segment, and that dissection was not so common in those days as now; that the genus was new; and that the probability, judging from the structure of the majority of species of Amphipoda, was that the third peræopods should resemble the fourth pair rather than the second.

The possibility of such a mistake having been made by Dana is shown by the errors of other systematists in describing this or allied species of *Stenothoë.* Thus:—

(1) Spence Bate (Cat. Amph. Brit. Mus. p. 60), having copied Dana's definition of the genus, which says that "The basos of the antepenultimate pair of pereiopoda is squamiformly developed," includes *S. clypeata*, Stimpson (Mar. Invert. Grand Manan, p. 51), and figures the third peræopod

in accordance with it (*l. c.* p. 60, pl. ix. fig. 1), regardless of Stimpson's statement, "Legs of the 5th pair [*i. e.* 3rd peræopods] wanting the expansions of the basal joints." An examination of Bate's type specimens at the British Museum, kindly made by Dr. W. T. Calman, proves Stimpson to be right.

(2) Prof. Della Valle, in his description of *S. valida,* Dana, in F. Fl. Neapel (Gammarini), p. 567, says that the *fifth* and *sixth* pairs of thoracic legs (third and fourth peræopods) have the *squama* rather large, thus apparently confirming Dana. But on being asked at my instance, by the good offices of Dr. P. Mayer, if this was correct, he replied that it was a *lapsus calami*, and ought to have been *sixth* and *seventh* pairs, in proof of which he kindly sent me, through Dr. Mayer, drawings of the three pairs of peræopods, showing the second joint of the third pair narrow as in the first and second.

(3) In Rep. Ceylon Pearl Fisheries, vol. ii. p. 262, pl. iii. fig. 19, I described *Stenothoë gallensis*, a species differing from *S. valida* only in the absence of a distal tooth on the palm of the second gnathopod in the female and a peculiarly formed second joint in the ramus of the third uropod of the adult male. Unfortunately in describing from a mounted specimen of which the limbs were displaced, I mistook, and consequently described and figured, the fourth peræopod for the third. This was corrected in Trans. Linn. Soc., 2nd ser. Zool. 1909, vol. xii. p. 331. The second joint of the third peræopod is "linear" or narrow-oblong, as in the first and second pairs.

If the view be accepted that Dana was mistaken in his description of the third peræopod, then to the list of synonyms in the Amphipoda of 'Das Tierreich' must be added *Stenothoë assimilis*, Chevreux, Bull. de l'Inst. Océanograph. Monaco, 1908, Mars. p. 4, figs. 4–6.

I have examined specimens from the coast of Peru from the U.S. Nat. Museum, Washington, which agree perfectly with Dana's description except as regards the third peræopods, which are linear.

Genus HEMIJASSA, A. O. Walker, Nat. Antarct. Exped. vol. iii. p. 38.

Hemijassa ocius (Sp. Bate).

Like *Jassa*, but uropod 3 not projecting beyond 1 and 2 and having the outer ramus without secondary teeth or curved spines.

For references see 'Das Tierreich,' Amphipoda Gam. pp. 655 & 739, under *Jassa ocius*; also Chevreux, Résult. Camp. Monaco, p. 107.

H. ocius is well described in the 'Tierreich' Gammaridea and well figured by Della Valle, whose figure of gnathopod 2 ♂ is erroneously marked "♀," but correctly referred to in the text. To the characters given by various authors may be added the following:—

Antenna 1: the accessory flagellum is so thin that when closely applied to the joint, as it usually is, it can only be distinguished by the fringe of unequal setæ on its truncate extremity.

Gnathopod 2: the palm is so densely clothed with plumose setæ that it is difficult to see its structure.

Podocerus (*Jassa?*) *dentex*, Czerniavski, is referred to *H. ocius* by Della Valle and Chevreux, while Stebbing (Tierreich Gamm.) gives it as a distinct species and identifies it with *Podocerus herdmani*, Walker (=*P. odontonyx*, G. O. Sars). As Czerniavski does not describe the uropods, it is impossible to be certain on this question, but he says that the accessory flagellum of antenna 1 is "rudimentary"—a character that suits *H. ocius* better than *J. herdmani*. His description of the hand of gnathopod 2 with "*dentibus duobus posterioribus magnis*" (two large posterior teeth) agrees perfectly with *H. ocius*, while a reference to Sars's figure of *Podocerus odontonyx* (=*Jassa herdmani*) in Crust. Norway, pl. ccxiii. fig. 2, will show that this species has only one posterior tooth, which I have never known to be bifid. As to the question of the distinctness of *J. herdmani* from *J. falcata* (Montagu), =*J. pulchella*, Leach, see Ann. & Mag. Nat. Hist. ser. 6, vol. xv. p. 473, and Trans. Liverpool Biol. Soc. vol. ix. p. 314; also Norman & Scott, Crust. Devon and Cornwall, p. 92.

The Genus Leptocheirus.

This has hitherto been classed with the Photidæ. I venture to suggest that its proper position is in the Aoridæ, with which it is connected by such forms as *Coremapus versiculatus* (Bate) and *Lembos leptocheirus*, A. O. W. (Trans. Linn. Soc., 2nd ser. Zool. vol. xii. (1909) p. 338, pl. xliii. fig. 7). The first gnathopods, though not (except in *L. cornu-aurei*, Sovinski) longer, are certainly stronger than the second.

IV.—*Some new Late Pleistocene Voles and Lemmings.*

By MARTIN A. C. HINTON.

As some considerable time will elapse before my work dealing with the British Fossil Voles and Lemmings can be published, and as some of the Late Pleistocene forms throw considerable light upon certain problems of geographical distribution at present confronting zoologists, it seems advisable to publish the following diagnoses. I have, firstly, to thank Mr. W. J. Lewis Abbott, Dr. Frank Corner, Mr. A. S. Kennard, Dr. H. C. Male, and the Rev. E. Mullins for the loan of material, Mr. Oldfield Thomas for the facilities he has kindly afforded for examining the recent material in the British Museum, and Mr. Gerrit S. Miller for much valuable assistance and advice.

Arvicola abbotti, sp. n., foss.

Type.—An adult skull in the collection of Mr. Lewis Abbott from the Ightham Fissures (Late Pleistocene).

Characters.—Size large (condylo-basal length of adult skull 41·0 mm.). Skull showing extreme fossorial specialization; incisors straightened and protruding, the straightening far more pronounced than in any living member of the *A. scherman* group; incisive foramina very small; postorbital squamosal crests very weak; occiput, in adults, sloping forwards conspicuously, the interparietal becoming reduced and its posterior margin boldly convex instead of nearly straight; lambdoid crest markedly sinuous and ridge for *ligamentum nuchæ* prominent; mesopterygoid fossa very narrow, postero-lateral palatal pits extensive, the fossæ for origin of *pterygoideus internus* muscle correspondingly increased in extension; mandible with very small angular process, the incisor root ascending nearly to condyle and making a strong hump externally; molar teeth very light, enamel pattern substantially as in *A. amphibius*.

Measurements.—Type skull: condylo-basal length 41 mm.; zygomatic breadth 25·2; interorbital constriction 4·8; occipital depth (median) 10·1; diasteme 14·0; molar series (alveolar) 9·5; condyle to alveolus of last molar 15·6.

Specimens examined.—Four complete and about a dozen fragmentary skulls from the Ightham Fissures.

Remarks.—*A. abbotti* is of great interest, since it affords the highest expression of that fossorial specialization which is seen beginning in the Scandinavian *A. terrestris*, and which is well developed in the *A. scherman* group of Central and Southern Europe *. It is distinguished from the living members of the latter group not only by its more highly specialized occipital region, but by the greater specialization of the pterygoid region and its larger size. So far as is known, the species is confined to the latest portion of the Pleistocene period in Britain, and has hitherto only been found in the deposits of the Ightham Fissures.

Microtus corneri, sp. n., foss.

Type.—An adult skull in the collection of Dr. Frank Corner from the Ightham Fissures (Late Pleistocene).

Characters.—Skull essentially as in *M. orcadensis* and its allies; nasals and maxillary tooth-row a little shorter, diasteme a little longer proportionally than in any of the living members of the group; incisors a little straighter and more protruding than in *M. orcadensis*; upper surface of superior ramus of maxillary root of zygoma thickened, fusiform expansion of maxilla and jugal more extensive than in *M. orcadensis* and *sandayensis*; interparietal shorter in proportion to width than in adult *M. orcadensis*, the adult *M. corneri* presenting the interparietal form of young *M. orcadensis*; brain-case differing from that of *M. orcadensis* in being somewhat narrower and more depressed, from *M. sandayensis* in being considerably narrower, and from that of *M. sarnius* in being proportionally broader. Taking the distance from interorbital constriction to lambdoid crest as 100, the breadth of the brain-case at front edge of squamosal root of zygoma amounts to

95 in *M. sandayensis westræ*. Type, B. M.
93 in *M. sandayensis*. B. M. 6. 11. 18. 9.
90 in *M. orcadensis*. B. M. 5. 12. 13. 2.
85 in *M. corneri*. Type.
78 in *M. sarnius*. B. M. ♂, 8. 9. 2. 27. Type.

The constricted interorbital region is shorter than in *M. orcadensis*, almost exactly as in *M. sandayensis*; molar teeth of normal *arvalis* pattern, very light.

Measurements.—Type skull: condylo-basal length 28·8 mm.; zygomatic breadth 16·5; interorbital constriction 3·6; occipital breadth 13·0; occipital depth (median) 7·0; nasal 7·9; diasteme 9·1; maxillary tooth-row 6·2.

Specimens examined.—One perfect and more than a dozen fragmentary skulls, including one example from the Langwith Cave, Derbyshire; the others from the Ightham Fissures.

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* Miller, Proc. Biol. Soc. of Washington, 1910, March, pp. 19-22.

Remarks.—In view of what Dr. Forsyth Major has stated on a previous occasion [*], it is exceedingly satisfactory to find a Pleistocene forerunner of *M. orcadensis* upon the British mainland. In turn it may be stated that the existence of another member of the same group in the Channel Islands, *M. sarnius* [†], seems to indicate that we received *M. corneri* from France. At Ightham we find in addition skulls of a smaller member of the *arvalis* group possessing close affinity with the *M. arvalis* of Belgium, and this I think came to Britain by another route—across the bed of the North Sea—during the last great elevation of North-western Europe in very late Pleistocene times. This subject is more fully dealt with in a paper shortly to be published in the 'Proceedings of the Geologists' Association.'

Microtus anglicus, sp. n., foss.

Type.—A nearly perfect adult skull in the collection of Dr. Frank Corner from the Ightham Fissures (Late Pleistocene).

Characters.—Skull essentially as in the Asiatic "*Stenocranius*" group of Kastchenko, long and narrow; rostrum long, broader than interorbital region; interorbital region greatly constricted, the temporal ridges in adults meeting early to form a long well-defined saggital crest; zygomatic arches heavy and, for "*Stenocranius*," flaring; postorbital (squamosal) processes prominent; brain-case shorter than in extreme "*Stenocranius*;" interparietal large, rather long antero-posteriorly; diasteme long; incisors protruding beyond nasal tips; palate narrow, boldly sculptured with deep postero-lateral pits and very narrow median septum.

Dentition: maxillary molars having the general pattern of *M. arvalis* group; mandibular molars, the anterior one with five closed triangles as usual, the fourth outer angle greatly reduced, so that the external border of anterior loop is perfectly straight typically; antero-external triangle of last lower molar greatly reduced; enamel sheet in all molars well differentiated, the thin portions, forming posterior walls of prisms of lower and anterior walls of prisms in upper molars, frequently obsolete.

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[*] Forsyth Major, Ann. & Mag. Nat. Hist. ser. 7, vol. xv. 1905, p. 324.

[†] Miller, Ann. & Mag. Nat. Hist. ser. 8, vol. iii. 1909, p. 420. The type of *M. sarnius* is very old and its skull very narrow. Mr. Miller was led accordingly to regard the species as a member of the *M. agrestis* group. Further material has turned up, and Mr. Miller now fully agrees with the view expressed above as to the affinity of this form.

Measurements.—Type skull: condylo-basal length 26·9 mm.; zygomatic breadth 14·0; interorbital constriction 2·7; occipital breadth 11·9; occipital depth (median) 6·4; nasal 7·1; diasteme 8·7; molar series (alveolus) 6·4.

Specimens examined.—Two nearly perfect and a very large series of imperfect skulls from the Ightham Fissures and numerous specimens from other Late Pleistocene deposits.

Remarks.—This species has long been known to palæontologists as a conspicuous element in the Late Pleistocene fauna of Western Europe, and they have hitherto followed the lead of Nehring in referring it to *M. gregalis* of Pallas. The skull-measurements given by Pallas show that whatever the imperfectly known *M. gregalis* may be it certainly has little to do with the fossil animal. The zygomatic and occipital breadths, when compared with the skull-length taken as 100, amount to 45·5 and 36·4 respectively in *M. gregalis*, and to 52·0 and 44·2 in *M. anglicus*. Among the living species of "*Stenocranius*" of which I have seen skulls or descriptions *M. tianshanicus*, Büchner, appears to make the nearest approach to *M. anglicus* in skull and dentition; it differs principally in the narrower palate, narrower and shorter rostrum, and lighter zygomatic arches.

Dicrostonyx henseli, sp. n., foss.

Type.—A perfect adult skull in the collection of Mr. Lewis Abbott from the Ightham Fissures.

Characters.—Size small. Skull: dorsal outline gently convex; combined nasal width little more than a third of nasal length; zygomatic arches flaring more than in *D. torquatus* (Discovery Bay); palate feebly sculptured with complete postero-lateral bridges; auditory bullæ very small, egg-shaped, and not inflated anteriorly; presphenoid reduced to a slender rod; molars heavy.

Dentition: in the anterior upper molar the fourth or postero-internal prism is reduced, its hinder wall has lost its primitive curvature and passes into the posterior wall of the small fourth outer triangle without forming any minute postero-internal accessory (*i. e.* vestigial) angulation; in the second upper cheek-tooth the third inner prism is similarly reduced; antero-external triangle of last lower molar much smaller than second one, and passes in front into the anterior wall of the tooth without forming any minute antero-external vestigial angulation.

Measurements.—Type skull: condylo-basal length 28·6 mm.; zygomatic breadth 19·8; interorbital constriction 4·0; occipital breadth 14·0; occipital height (median) 6·8; breadth of rostrum 5·9; nasal 8·7; diasteme 9·2; molar series (alveolar) 7·4.

Specimens examined.—One perfect and two fragmentary skulls, together with a large number of lower jaws from the Ightham Fissures; two or three maxillæ with teeth and numerous lower jaws from the Doneraile Cave, Co. Clare (kindly lent by Dr. Scharff); and a maxilla from the Langwith Cave, Derbyshire.

Remarks.—The more reduced maxillary molar pattern differentiates *D. henseli* from *D. torquatus* and its allies and connects this species dentally with *D. hudsonius*. The latter species is of larger size, but, apart from the agreement in the teeth, the skull presents several points of similarity with the fossil. It is distinguished principally by its expanded nasals, rather broad and flat presphenoid, somewhat lighter teeth, and slightly longer diasteme. The skull long ago described by Hensel from the Pleistocene of Quedlinberg, in Saxony *, appears to agree with that of the species here described, and as that acute observer pointed out first the dental distinction from *D. torquatus* †, the species is here named in his honour.

Dicrostonyx gulielmi, Sanford.

"*Arvicola*" *gulielmi*, Sanford, Quart. Journ. Geol. Soc. vol. xxvi. p. 125 (1870) (name given to lower jaws from Somerset caves).

Lemmus torquatus, var., Sanford, *op. cit.* pp. 124, 126 (skull from Somerset caves).

Specimens examined.—Anterior part of an adult skull and many lower jaws in the collection of the Rev. E. Mullins from the Langwith Cave, Derbyshire; parts of two skulls, a lower jaw, and detached teeth from a cave in the Wye Valley, collected by Miss Dorothy Bate (now in British Museum); and part of a youngish skull from Puy de Dôme, Nescher (B.M.).

Characters.—Size large. Skull: nasals much expanded in front, their combined width half the nasal length; zygomatic arches very heavy; palate boldly sculptured with incomplete lateral bridges; incisive foramina short and broad; presphenoid reduced to a slender bar; teeth very heavy.

Dentition: the posterior walls of the hinder inner triangles in the first and second maxillary molars not reduced, they retain their curvature and thick enamel and form a more or less well-marked accessory or vestigial inner angulation behind; third or antero-external prism of last lower molar less reduced than in *D. henseli*, and there is frequently a more or less well-marked minute fourth outer vestigial angulation.

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* Hensel, Zeits. d. deutsch. geol. Ges. Bd. vii. p. 493, pl. xxv. figs. 12 & 18.

† *Ibid.* Bd. viii. p. 279, pl. xiii. fig. 1 *a*.

Measurements.—Langwith Cave skull: breadth of rostrum 7·0 mm.; length of nasal 9·5 (ca.); diasteme 9·6; molar series (alveolar) 8·3.

Remarks.—The maxillary teeth of the skull figured by Sanford from the Somerset caves (Q. J. G. S. xxvi. pl. viii. figs. 4 & 4 *a*) agree with those of the species here described and with *D. torquatus*. There is every reason to suppose that the lower jaw from the same place figured by Sanford (*loc. cit.* figs. 2 & 2 *b*), and to which he gave the name of "*Arvicola*" *gulielmi*, belongs to the same species of *Dicrostonyx* as does the skull, despite the abnormal appearance of the last lower molar; and therefore, unless it can be shown that the lower jaw does come from a different species, the name of "*gulielmi*" must be used for this species.

D. gulielmi is distinguished from *D. torquatus*, with which it agrees in tooth form, by its considerably larger size, shorter and broader incisive foramina, broader nasals, and much heavier teeth. Dr. Forsyth Major as long ago as 1872* called attention to the dental differences in the fossil forms and suggested that there were two species of *Dicrostonyx* in the Pleistocene deposits of Western Europe, and it affords me great pleasure to be able to support the suggestion by establishing it as a fact.

V.—Microchœrus erinaceus (*Wood*). By C. Forster-Cooper, M.A., F.Z.S., Trinity College, Cambridge, University Demonstrator in Animal Morphology.

[Plate III.]

THIS revision of the interesting little form *Microchœrus erinaceus* is the result of an examination of the specimens contained in the collection of the British Museum (Natural History) and in that of the Sedgwick Museum at Cambridge. I am indebted to Dr. A. Smith Woodward, F.R.S., and to Professor T. McKenny Hughes, F.R.S., for permission to study the specimens in their collections.

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* Forsyth Major, Atti di Soc. Ital. di Sciens. Natur. xv. p. 128 (1872).

All the fragments come from the Upper Eocene at Hordwell in the Isle of Wight, and the following list represents, so far as I am aware, all the known specimens.

In the British Museum :

1. Palate with complete dentition of both sides. (Type.)
2. Two portions of upper jaws with molars.
3. Part of right mandibular ramus with pm $\overline{4}$, m $\overline{1.2.3}$. (Type.)
4. Part of right mandibular ramus with pm $\overline{3.4}$, m $\overline{1.2.3}$, and sockets for front teeth.
5. Part of right mandibular ramus with pm $\overline{4}$, m $\overline{1.2.3}$.

In the Sedgwick Museum :

1. Part of the interorbital region of skull with the hind part of the palate and the last two molars of each side.
2. Middle part of left ramus with pm $\overline{2.3.4}$, m $\overline{1.2.3}$.
3. Middle part of corresponding right ramus associated with the above pm $\overline{3.4}$, m $\overline{1.2.3}$.
4. Complete hinder part of left ramus with the three molars.
5. Various smaller fragments in poor condition, also separate teeth.

The position of *Microchœrus* cannot be satisfactorily determined, owing to the unfortunate lack of skeletal parts other than jaws and teeth ; but since the descriptions of this form hitherto published have been brief and the figures not altogether satisfactory, it is perhaps worth while to refigure it, in view of its possible relationship with the American form *Hyopsodus* (now regarded as an Insectivore) as well as with *Necrolemur* and other primitive Primates.

The upper teeth are nine in number, forming a closed series 2·5 cm. in length, showing considerable curvature and having a width of 2 cm. at the widest point (measured at the outside edges of the second molars). The palate shows some signs of having a posterior thickened border *.

The teeth are as follows :—In front is a large single-rooted tooth on each side, separated the one from the other by a considerable space in which another small pair of incisors could have been present. This part, however, is broken away. The two large teeth measure 2·5 mm. in length and 1·75 in breadth, and probably represent the second pair of incisors. The following tooth is smaller and round, 1·5 mm. in diameter, and must be regarded as the third incisor. In this case the next tooth, which is but little smaller than I_{2}, represents the canine, although the maxillary suture cannot be made out: it is semi-procumbent, with the crown set well forward on its single root.

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* The Cambridge specimen shows indications of large orbits with narrow frontals in between.

The first premolar of the series (pm 2) is smaller than the canine, single-rooted, and with a small talon. Premolars 3 and 4 are two-rooted, square in outline, and with a large external and small internal cusp; they are not in any way molariform in pattern. The first two molars are square in shape and subequal in size, being 3·75 mm. in length and 4 mm. across. The protocone, paracone, and metacone are conical, roughly equal in size, and in the unworn tooth moderately sharp. The hypocone is somewhat smaller and is placed behind the protocone, but a little more in towards the median line of the palate. The protoconule arises near the anterior cingulum a little in advance of a line connecting the protocone and paracone; the hypoconule occupies a similar position in respect to the metacone and hypocone and in the first molar equals the protoconule in size, in the second molar it is smaller, and in the third is hardly developed at all. A strongly marked cingulum runs along the front and outer borders of these teeth; there is, moreover, a tendency to small secondary wrinklings in the enamel on the surface.

The last molar is smaller, rounder, and generally less developed than the rest. A small but exceedingly clearly marked mesostylar tubercle is present on all three teeth near but separated from the cingulum between the para- and metacone.

The mandible has the following measurements:—

	cm.
Complete length between perpendiculars	4·35
Height of articular surface from base of angle	3·15
Greatest depth of ramus (between pm$_{\overline{4}}$ and m$_{\overline{1}}$)....	·85
Depth of ramus under m$_{3}$	·75

The articular surface is high up and is at the same level as the coronoid process. The angle is strongly marked and projects downward. The ramus is stout and turns up rather abruptly in front of the large first tooth to form a "chin."

There are eight teeth in the lower dentition. The front one is broken away in all specimens, but the deep alveolus, 2 mm. in breadth, shows that it must have been of fair size. Wood, in his figure of the type specimen before it became damaged, shows it as a long semi-procumbent tooth. Immediately behind this, lying to the outside of the series, is a small socket which represents either the third incisor or the canine. The following six teeth lie in a closed curved series and consist of three premolars and three molars. The first two premolars (pm $\frac{\quad}{3.4}$) are semi-procumbent and single-rooted, the last premolar has in addition an internal cone and a second root. There is a gradual increase in size, the last tooth having an antero-posterior diameter of 3 mm.

The first two molars are equal in size, 3·5 mm. in length and 3 mm. across; the first has a distinct paraconid, which is lost in the following teeth. The last molar has an enlarged talon and third root.

In all the lower teeth the external cingulum is well marked and the molars show the same tendency to secondary wrinkles as the upper ones.

As I have stated above, the precise position of this form is as yet obscure, as is the case with so many of the primitive Eocene Primates and Insectivores. Wood, the describer of the type, placed *Microchœrus* with *Hyracotherium*, to which form it has only the very slightest and most superficial resemblance; but that he was rather doubtful of its true nature appears, as Lydekker has pointed out, in the specific name given to it. Lydekker himself claims it as one of the Erinaceidæ and as allied to *Hyopsodus*, but Matthew has now shown that the latter belongs to a group of Insectivores well defined from *Erinaceus*, and Schlosser further gives his opinion against any affinity between *Microchœrus* and *Erinaceus*. The latter author considers it to be allied to *Hyopsodus* and *Pelycodus*, the latter a Primate, while the former is an Insectivore, as both Matthew and Wortman have shown.

Microchœrus differs from *Hyopsodus* in several particulars; the tooth-formula is $\frac{2.1.3.3}{1.1.3.3}$ or $\frac{2.1.3.3}{2.0.3.3}$, against $\frac{3.1.4.3}{3.1.4.3}$. In the latter form none of the anterior teeth are enlarged, the premolars have a more distinctly pronounced talon, and the upper molars are without the mesostyle.

Wortman suggests an alliance with *Necrolemur*, and the general shape of the lower jaw and the tooth-formula, even to the small and vestigial second tooth, shows a striking resemblance. The only difference is the absence of the mesostyle in the upper molars in *Necrolemur*. On the whole, with the material at command, it seems best to regard these two forms as the nearest relations hitherto known.

References.

Wood.—London Geological Journal. 1845.
Lydekker.—Quart. Journ. Geol. Soc. xli. 1885.
Schlosser.—Beit. z. Pal. Oest.-Ung. 1887.
Wortman.—Amer. Journ. Sci. xv. 1903.
Matthew.—Mem. Amer. Mus. Nat. Hist. ix. part 6.

EXPLANATION OF PLATE III.

Fig. 1. ***Microchœrus erinaceus.*** Palate (British Museum).
Fig. 2. Ditto. Right lower ramus, inner side (Cambridge).
Fig. 3. Ditto. Right lower ramus, outer side (British Museum). The small socket for the second tooth can be made out as a small black dot at the upper point of the large socket.
Fig. 4. Ditto. Right lower ramus, inner side (Cambridge).
Fig. 5. Ditto. Upper molars (British Museum).
Fig. 6. Ditto. Hind part of left ramus (Cambridge).
Fig. 7. *Necrolemur edwardsii.* Hind part of left ramus (British Museum).
Fig. 8. Ditto. Front part of left ramus (British Museum).

The lines underneath the figures indicate the natural size of the specimens.

VI.—*On new Species of* Histeridæ *and Notices of others.*

By G. Lewis, F.L.S.

The last paper of this series was published in September 1909, and the present is the thirty-sixth.

List of Species.

Hololepta nepalensis.
Trypanæus terebrans.
—— colombiæ.
Coptotrophis ornatula.
—— mendozæ.
Teretriosoma intrusum, *Mars.*
—— biguttatum.
—— centenarium.
—— striatum.
Teretrius marginatus.
Platylister pacificus.
—— placitus, *Lew.*, 1906.
    bandæ, Lew., 1909.
—— patruus.
Platysoma brahmani.
Ebonius æquatorius.
Cornillus binodulus.
Contipus somaliensis.
Exorhabdus, gen. nov.
Hister belli, *Lew.*
—— simulator.
—— guinensis, *Payk.*
—— asoka.
—— virginiæ, *Casey.*
—— montanus, *Mars.*, 1857.
    pyxidatus, Lew., 1889.
    pharaonis, Sch., 1889.
—— belti, n. n.
    castaneus, Lew.
Peranus bimaculatus, *Linn.*
Pachycræerus hyalus.
Chlamydopsis formicicola, *King.*
Saprinus ærarius, n. n.
    æratus, Lew., 1909.
Hypocaccus varians, *Sch.*
—— apricarius, *Er.*

Hololepta nepalensis, sp. n.

Oblonga, subdepressa, nigra, nitida; mandibulis in medio unidentatis; pronoto lateribus punctato; elytris striis 1 dorsali integra, 2 brevi, 3 brevissima; propygidio parce, pygidio dense, punctatis.

L. 7 mill. (cum mandibulis).

Oblong, somewhat depressed, black and shining; the head, mentum relatively rather small, with a linear tubercle, surface slightly uneven, ocular tubercle rather small and obtuse, mandibles each with a small tooth near the middle of the inner edge, labrum bilobed; the thorax, marginal stria rather fine and terminating at the anterior angle, laterally there is a rather broad band of punctures not closely set but clear; the elytra, the marginal fossette is rather deep, 1 dorsal stria complete with the apical end bent inwards, 2 dorsal basal and not quite one-third in length of the first, but well marked, 3 very short; the propygidium is thinly punctured, the points on the sides are somewhat large, gradually becoming smaller to the disk; the pygidium is very densely punctured; the anterior tibiæ are 4-dentate.

The exceptional characters of this small species are the toothed mandibles and the complete first dorsal stria.

Hab. Nepal, Central India. One male example.

Trypanæus terebrans, sp. n.

Cylindricus, elongatus, niger, nitidus; fronte bisulcata, bispinosa, rostro apice modice reflexo; pronoto antice bituberculato; prosterno marginato; mesosterno stria marginali antice interrupta; tibiis anticis 5-dentatis.

L. 7½ mill.

Cylindrical, elongate, black and shining; the head, forehead bisulcate, sulci parallel to each other, with a well-marked carina between them, rostrum a little reflexed apically, point not very acute, ocular tubercles strong and somewhat obtuse; the thorax is impressed at the anterior angles and the surface evenly and sparingly punctulate, near the edge behind the middle of the neck are two tubercles which are somewhat obtuse and join by the widening out of their bases; the elytra are similarly punctulate; the pygidia are evenly and somewhat closely punctate; the prosternum, the keel is marginate laterally and the striæ gradually meet anteriorly; the mesosternum is marginate at the sides, but the striæ are interrupted behind the keel of the prosternum, the surfaces of the sterna are sparingly and rather obsoletely punctured; the metasternum has a median furrow; the anterior tibiæ are 5-dentate.

This is the largest species known of which the male has a conspicuous ocular tubercle; the other species are *unituberculatus*, *bispinus*, and *spiniger*, Mars., *bimaculatus*, Er., *ros-*

tratus and *colombiæ*, Lew. (described below). *T. unituberculatus* is peculiar in having a median furrow in the mesosternum, which is immarginate laterally. In *Hololepta* the ocular tubercle is less perpendicular than in *Trypanæus*, as might be expected from their depressed form.

Hab. Bolivia.

I have only one male example, but I have adopted a trivial name suggested by Herr J. Schmidt some years ago, and his collection doubtless contains other specimens.

Trypanæus colombiæ, sp. n.

♂. Cylindricus, niger, nitidus; fronte haud carinata, bisulcata, medio longitudinaliter impressa, rostro acute reflexo; pronoto margine antice fortiter punctato, unituberculato; elytris sparse punctulatis; pygidio sat dense punctato; prosterno antice acuto, immarginato; tibiis anticis 5-dentatis.

L. 6¼–6½ mm.

Cylindrical, somewhat robust, black and shining; the head, forehead bisulcate, sulci narrow and shallow anteriorly, widening and deepening between the eyes, the median carina in the allied species is represented by a longitudinal shallow canaliculation, the ocular tubercles are somewhat acute and the apex of the rostrum is pointed and markedly reflexed; the thorax is densely and coarsely punctured along the anterior part, the anterior angles are not impressed, but they have a marginal carina, in the middle behind the neck there is a single tubercle, behind the tubercle the thorax generally is finely and not closely punctulate, but longitudinally the punctures are closer and larger in the middle; the elytra are also finely punctulate generally, but along the sutural and apical margins the punctures are larger and (especially at the apex) closer together; the pygidia are rather closely punctured; the prosternum, keel immarginate, punctured, and gradually narrowed to the apex; the mesosternum is also immarginate; the anterior tibiæ 5-dentate.

The female: the head is opaque and finely punctulate, rostrum very obtuse; the thorax clearly and evenly punctured throughout, points generally larger than those of the male; the prosternum, keel nearly smooth, somewhat obtuse at the apex, and distinctly marginate; the metasternum is canaliculate and its basal half strongly punctate.

This is the most robust species known with an ocular tubercle.

Hab. Colombia.

Coptotrophis ornatula, sp. n.

♂. Cylindrica, rufo-brunnea, nitida; fronte bisulcata, rostro apice acuminato; pronoto stria marginali antice late interrupta, bituberculato; elytris punctulatis, apice infuscatis; prosterno parallelo, utrinque carinato; mesosterno lateribus tenuiter sulcato; tibiis anticis 5-dentatis.
L. 2½–2⅔ mill.

Cylindrical, reddish brown, shining; the head and rostrum microscopically transversely strigose, with a few punctures between the eyes, rostrum parallel laterally and bisulcate, sulci rather shallow, apex with a small acumination; the thorax, margins and angles clearly red, median area darker, punctuation rather close behind the head and gradually becoming fine and more sparing to the base, well behind the neck are two small tubercles, and in front of them the thorax is triangularly flattened; the elytra are reddish, with two dark patches which apically leave a narrow red margin; the pygidia are punctulate; the prosternum, keel parallel laterally and markedly carinate along its edge, truncate anteriorly and incised at its base; the mesosternum is not marginate anteriorly, but it is minutely sulcate on either side; the anterior tibiæ are 5-dentate.

The female: the rostrum is rather broad anteriorly and nearly semicircular in outline, forehead feebly impressed between the eyes, and the surface strigose as in the male, the thoracic punctures are evenly distributed and closer and more distinct generally than those of the male.

Hab. Santarem and Bahia, Brazil.

Coptotrophis mendozæ, sp. n.

Cylindrica, parum elongata, nigra, nitida; fronte minute tuberculata, rostro utrinque sulcato; pronoto vix dense punctato; prosterno parallelo, lateribus marginato; mesosterno bisulcato; tibiis anticis 5-dentatis.
L. 3⅓ mill.

Cylindrical, rather elongate, black and shining; the head, rostrum bisulcate, obtusely angular at the apex, with a very minute tubercle at its base on the vertex of the head, surface microscopically strigose with scattered shallow punctures; the thorax is clearly and somewhat closely punctured, the rim at and behind the anterior angle is raised and reddish brown, there is an impression behind the neck, and behind the impression are two very slightly raised tubercles; the elytra are much more finely punctured; the pygidia are densely punctate; the prosternal keel is parallel laterally, with a marginal stria which indistinctly joins anteriorly but does not continue along the base; the mesosternum is anteriorly obtuse, with a shallow lateral sulcus, the sulci are shortened anteriorly and bend towards each other; the metasternum has a longitudinal sulcus in the anterior part; the anterior tibiæ are 5-dentate.

The female: the rostrum is simply obtuse in front and there is a wide circular impression between the eyes, and the thorax is simply convex behind the neck.

Hab. Argentina (*C. Bruch*). One male and one female.

Teretriosoma intrusum, Mars., 1870.

Mr. E. P. Stebbing has found this Indian species associated with *Calopertha truncatula*, Ancey, an insect of a rather wide distribution in the Asian area, and one very nearly of the same girth and on which I do not doubt it fed. The Histeridæ, however, do not always confine themselves to one species, as I found *Trypeticus veda*, Lew., in Ceylon feeding on *Minthea canaliculata*, F., and on *Platypus furcatus*, Bland., both species being similar to the Histerids in circumference. In July 1878 I, with others, found *Teretrius picipes*, F., feeding on *Minthea canaliculata* and *brunnea*, Steph. Mr. Waterhouse has, as already noticed in this Magazine, bred an African *Teretrius* in the British Museum from acacia-bark infested with *Xylopertha* and *Sinoxylon*, so that it seems clear that the larval and pupal stages are passed in the perforations of the species on which the imago feeds and that the larvæ are insectivorous. In Japan I found *Trypeticus fagi*, Lew., on several occasions feeding on *Platypus severini*, Bland., but under other conditions I think that they would have sought other species. It is incorrect to speak of the Histeridæ as being parasitical or commensal; they are predaceous and insectivorous.

Teretriosoma biguttatum, sp. n.

Subcylindricum, breve, supra nigrum, nitidum; antennis flavis, pedibus obscure rufo-brunneis; pronoto ad angulos minute flavo; metasterno postice transversim tenuissime striato; tibiis anticis 6-dentatis.

L. 2¼–2½ mill.

Subcylindrical, short and robust, black above, beneath somewhat brownish; the antennæ flavous, legs uniformly

reddish brown; the head, punctuation is smaller than that of the thorax and more evenly set, forehead convex; the thorax, the punctures are larger on the outer parts and along the base and finer and more sparse on the disk, the anterior angles are minutely flavous; the elytra are similarly punctured and also the pygidia, but the points are a little sparse on the median area of each elytron; the prosternum is closely punctured; the mesosternum has the punctuation larger, clearer, and less close, the acumination is obtuse and immarginate; the metasternum, the punctuation is much more sparse, and along the posterior edge, commencing in front of the posterior coxæ, is an extremely fine transverse stria; the anterior tibiæ are 6-dentate.

This species is shorter and more robust than any of the other Australian species known; it resembles in outline the New-World *T. immarginatum*, Lew.

I have an example of *T. somerseti*, Mars., so named by Marseul in 1879, and it has the anterior angles of the thorax reddish brown, and is a much narrower species than *biguttatum*.

Hab. Cairns, N. Queensland (*E. Allen*). In the Hobart Museum and my own collection.

Teretriosoma centenarium, sp. n.

Cylindricum, nigrum, nitidum, undique sat denso punctulatum; antennis pedibusque obscure brunneis; pronoto angulis anticis minute flavis; tibiis anticis 5-denticulatis.

L. 1½ mill.

Cylindrical, subparallel, black and shining above, rather densely and evenly punctured; the thorax, anterior angles are minutely flavous; the prosternum, anterior lobe somewhat finely marginate, surface coarsely and closely punctured; the mesosternum is similarly punctate, but the points are not closely set, the projection is somewhat obtuse, with a very fine marginal stria not very easily seen; the metasternum is similarly pointed, but the median line is narrowly free of punctures; the anterior tibiæ 5-denticulate.

The trivial name signalizes the present year as the centenary of the Argentine Republic.

Hab. Argentina.

Teretriosoma striatum, sp. n.

Subcylindricum, haud parallelum, nigrum, nitidum, undique sat

dense punctulatum; fronte lata, utrinque striata; antennis pedibusque rufo-brunneis; tibiis anticis 8-denticulatis.
L. 2½ mill.

Subcylindrical, but not parallel laterally, the widest part being behind the humeral angle, black and shining, legs and antennæ reddish brown, surface above is wholly, evenly, and somewhat closely punctulate; the head, forehead is widely transverse and parallel at the sides, with a well-marked lateral marginal stria and triangularly prominent before the eyes; the thorax, marginal stria complete; the prosternum, anterior lobe wide and narrowly marginate in front, surface with rather large and shallow punctures not closely set, and there are indications of two short striæ at the base of the keel; the meso- and metasterna have no visible suture, and laterally the punctuation is similar to that of the prosternum but more scattered, and in the median area the points are fine and less close, the mesosternum is marginate anteriorly and the projection somewhat obtuse; the anterior tibiæ have two denticulations close together near the tarsi and six at regular intervals behind them.

The broad transverse forehead with its well-marked lateral striæ are notable characters in this species.

Hab. Jalapa, Mexico.

Teretrius marginatus, sp. n.

Cylindricus, parallelus, rufo-brunneus, nitidus, undique parce punctulatus; antennis pedibusque concoloribus; elytris stria basali brevi obliqua; tibiis anticis 5–6-denticulatis.
L. 1½ mill.

Cylindrical, parallel on the sides, reddish brown, shining above, sparingly punctulate; the elytra with a short basal oblique stria at about one-third of the elytral width from the humeral angle; this stria is similar to that of *T. obliquulus*, Horn. The sterna are very finely and sparingly punctulate, the prosternal striæ are wide apart and at their bases are close to the coxæ, the striæ are fine and widen out gradually but very slightly from the base to the suture but do not join at either end, the anterior lobe has a conspicuous marginal stria which is continued posteriorly along the sides to the coxæ.

The chief specific characters of this species, as in many others in *Teretrius* and *Teretriosoma*, exist in the sterna.

Hab. Nepal, India.

Platylister pacificus, sp. n.

Oblongus, subparallelus, depressus, niger, nitidus; fronte clypeoque modice impressis, stria integra; elytris striis 1–2 integris, 3 interrupta; propygidio impunctato; pygidio margine subelevato; tibiis anticis 4-dentatis.

L. 5½ mill.

Oblong, somewhat parallel, depressed, black and shining; the head, forehead and clypeus moderately impressed, transverse stria rather fine and nearly straight; the thorax impunctate, stria complete; the elytra, dorsal striæ 1–2 complete, 3 interrupted in the middle, 4 indicated by an apical puncture, subhumeral wanting; the propygidium is smooth; the pygidium is densely and coarsely punctate, with the outer margin smooth and broad but not much elevated; the mesosternum sinuous, with a well-marked marginal stria; the anterior tibiæ are 4-dentate.

The smooth surface of the propygidium is a remarkable character in a species of this genus or of *Platysoma*. Fairmaire has described *P. connexum* from New Caledonia as being similar to *P. latisternum*, Mars., and I have received an example from Monsieur Oberthür labelled *connexum* which is *P. montrouzieri*, Mars. (see my note, Ann. & Mag. Nat. Hist. xx. p. 342, 1907). Marseul has given the measurement of the last species as 6 mm.; 4¼ is an outside measure, and 4 mm. is the size given for *connexum* by Fairmaire.

Hab. New Caledonia.

Platylister placitus, Lew., 1906.

Platylister bandæ, Lew. Ann. & Mag. Nat. Hist. iv. p. 293 (1909) (n. syn.).

The Banda Islands are close to New Guinea on the western side, and the species seems to be locally abundant.

Platylister patruus, sp. n.

Oblongo-ovatus, parum convexus, niger, nitidus; fronte leviter impressa, stria haud interrupta; pronoto stria marginali integra, ante scutellum distincte foveolato; elytris striis dorsalibus 1–2 integris, 3 in medio late interrupta; propygidio antice lævi postice transversim punctato; pygidio margine modice elevato, æqualiter punctato; mesosterno sinuato, stria marginali integra; tibiis anticis 4-dentatis.

L. 5–5½ mill.

This species is extremely similar in outline to *P. frontosus*, Mars., and *foveolatus*, Lew.; the elytral striæ are similar to the first and the scutellar fovea is like the second. The interstice of the thoracic margin is narrower than in either species. *P. foveolatus* and *frontosus* agree in both having the frontal stria interrupted at the sides.

Hab. Efate Island, New Hebrides (*J. J. Walker*). Many specimens, August 1900.

Platysoma brahmani, sp. n.

Oblongum, subdepressum, nigrum, nitidum; fronte leviter impressa, stria integra; pronoto lateribus late punctato, stria marginali post oculos interrupta; elytris striis 1–3 integris, 4–5 et suturali abbreviatis; mesosterno sinuato, marginato; tibiis anticis 4-dentatis.

L. 3½ mill.

Oblong, rather depressed, black and shining; the head finely and closely punctulate, forehead and clypeus a little depressed, stria complete; the thorax, lateral stria sinuous in the middle, and continues behind the head, where it departs from the edge and leaves a somewhat wide marginal space, it is obscurely interrupted behind the eyes, the lateral area is broadly punctured, points varying in size; the elytra, striæ 1–3 complete, 3 a little sinuous, 4 apical and not quite reaching the middle, 5 two-thirds only of the length of the fourth, sutural short and detached, being just behind the middle, the apical margin is punctulate; the propygidium has rather large shallow ocellate and irregular punctures with small points intermixed; the pygidium similarly punctured, with the apex smooth and immarginate; the mesosternum is sinuous and distinctly marginate; the metasternum and the first segment of the abdomen is bistriate laterally; the anterior tibiæ are 4-dentate.

The form of the thoracic stria behind the head and the form of the sutural dorsal striæ are characteristic of this species.

Hab. Bengal, India. Found by Père Cardon at Barway and at Belgaum by Mr. Andrewes.

Ebonius æquatorius, sp. n.

Oblongus, angustatus, parallelus, supra depressus, niger, nitidus fronte punctata in medio longitudinaliter impressa, stria biarcuata; pronoto punctato; elytris striis integris, 5 et suturali basi conjunctis; pygidio grosse punctato; mesosterno utrinque punctato; tibiis anticis 5–6-denticulatis.

L. 7 mill.

Oblong, rather narrow, parallel laterally, depressed above, black and shining, forehead with a longitudinal median impression, stria complete and biarcuate anteriorly, surface somewhat coarsely and roughly punctured, clypeus and mandibles punctulate; the thorax, stria complete, surface somewhat closely punctured except in the scutellar region; the elytra, six dorsal striæ complete, fifth and sutural joining at the base; the propygidium with large and deep punctures, rather closely set; the pygidium with larger and deeper punctures and there is an obscure median transverse ridge; the prosternum, keel and lobe rather closely punctured, the first marginate at the sides and base; the mesosternum is punctured on each side and the striæ are similar to those figured (Ann. & Mag. Nat. Hist. xi. p. 421, 1893) for *E. politus*, Lew.; the anterior tibiæ are 5–6-denticulate.

This species differs from *E. politus*, Lew., by being relatively longer, less wide, and more parallel at the sides, by all the dorsal striæ being complete, and by the mesosternum being punctured laterally, not entirely smooth. In *politus* also the thoracic smooth scutellar area is very much wider.

Hab. Ecuador.

Cornillus binodulus, sp. n.

Ovatus, parum convexus, niger, nitidus; fronte leviter punctata in medio canaliculata, stria utrinque interrupta; pronoto stria marginali integra, basi ad angulos sinuata; elytris striis 1–3 integris, 4–5 obsoletis, suturali dimidiata punctis indicatis; propygidio tuberculato; prosterno bistriato mesosternoque distincte punctulatis.

L. 7 mill.

This species is similar in outline to *C. tuberculatus*, Lew., but it differs by the frontal stria being interrupted on either side and not joining posteriorly until near the base of the head. The striæ in both species are rather fine. The thorax, the marginal stria is complete and sinuous at the basal angle, and there is a small circular impression within the angle. In *tuberculatus* the stria is straight at the base and there is only a trace of an impression within the angle. The elytra, striæ 1–3 complete, with the edges crenulate and the third is punctiform apically, 4–5 are indicated by small apical irregular points, the sutural is punctiform, apical, and dimidiate; the pygidia are finely and rather closely punctulate; the prosternum, keel is bistriate anteriorly, stria rather short, surface and that of the meso- and metasterna are distinctly punctulate, the marginal stria of the mesosternum is interrupted. The punctuation of the sterna of *tuberculatus* is obsolete.

This is the fifth species of the genus known, and it is probable that their habits are peculiar and different to those of *Omalodes*, as the latter are generally captured in numbers and those of *Cornillus* in single examples only.

Hab. Matto Grosso, Brazil.

Contipus somaliensis, sp. n.

Ovalis, convexiusculus, niger, nitidus, mandibulis planis marginatis; fronte stria integra in medio angulata; pronoto stria interna postice flexuosa; elytris striis subhumerali interna integra, externa basi dimidiata, dorsalibus 1–4 integris parallelis, 5 dimidiata, suturali antice abbreviata; propygidio utrinque grosso punctato; pygidio sat dense punctulato; prosterno bistriato; mesosterno stria marginali interrupta; tibiis anticis 4-dentatis.

L. 6¾ mm.

Oval, rather convex, black and shining; the head, mandibles flat above and marginate on both sides, frontal stria complete and angulate in the middle; the thorax, inner stria flexuous towards the base, outer stria terminating before the angle; the elytra, striæ, outer humeral dimidiate and basal, inner complete, 1–4 dorsal complete and parallel to each other, 5 short and apical, sutural as long again as the fifth and reaching beyond the middle; the propygidium lightly pointed in the middle and somewhat coarsely on either side; the pygidium closely and evenly punctured; the prosternum is bistriate, striæ widening out between the coxæ and ending there, parallel and close anteriorly; the mesosternum is emarginate, and the stria is interrupted at the emargination; the anterior tibiæ are 4-dentate.

C. flexuosus, Sch., *oblongus*, and *immarginatus*, Lew., have the dorsal striæ widened out somewhat at the base; in the above the striæ are parallel to each other like those shown in Marseul's figure for *digitatus*.

Hab. Dire Daona, Somaliland, and Ghindo, Erythræa.

EXORHABDUS, gen. nov.

Body oval and a little convex, frontal stria complete, thorax with two well-marked lateral striæ, antennal fossettes are narrow longitudinal luniform excavations along the edge of the thorax immediately behind the angle, elytral subhumeral stria strong and complete and similar to the dorsal first stria (Paykull considered that *afer* had nine striæ), sutural stria incurved at either end, pygidia closely and markedly sculptured, prosternum compressed, mesosternum truncate and marginate, tarsal groove straight, tibiæ 3-dentate, terminal tooth very robust.

Type *Hister æneus*, Lewis.

The species for which this genus is established have hitherto been included in *Hister*, of which the type is *H. unicolor*, L., 1735; the species are *afer*, Payk., *æneus*, *africanus*, *angoniensis*, *crenulatus*, *marshalli*, *nyassæ*, *similis*, and *zambesius*, Lew. The last species was formorly assigned to *Zabromorphus*. The antennal fossettes in *unicolor* are wide, open, and shallow. ·The species I have placed in *Exorhabdus* differ considerably also in their general facies and are natives of middle Africa. *Hister scabripygus*, Sch., is described as having the subhumeral stria complete, but I have not seen the species. Schmidt describes *Hister obtusisternus* and *mechowi* as having the inner subhumeral stria complete, but this is not correct, anteriorly in both species it gives place to the fine oblique stria very generally seen in the Histeridæ.

Hister belli, Lewis, 1904.

There is an example of this species in the British Museum from Berhampur, India, which measures over 11 mm. The type specimen measures 9½ mm.

Hister simulator, sp. n.

Oblongo-ovatus, parum convexus, niger, nitidus; fronte stria semicirculari integra, mandibulis haud canaliculatis; pronoto stria interna integra, externa paulo breviore; elytris stria subhumerali nulla, 1–4 dorsalibus integris, 5 ante et suturali in medio abbreviatis; propygidio parum grosse haud dense punctato; pygidio similiter punctato sed apice lævi; mesosterno emarginato, stria in medio interrupta; tibiis anticis 3-dentatis.

L. 6–8 mm.

The facies of the above is extremely similar to *hottentotta*, Er., and others of the same group, but it differs by the frontal stria being almost semicircular, by there being no humeral sulcus or stria, and by the larger punctures, not very closely set, of the pygidia. The mesosternum is rather deeply emarginate and the marginal stria does not pass the emargination.

Hab. Senegal. Four examples.

Hister guinensis, Payk.

I have an example from Ashanti which corresponds exactly with Paykull's figure and description, except that the second and third dorsal striæ are not united. Paykull's specimen was evidently a monstrosity. The prosternal keel is microscopically strigose; the mesosternum is feebly and rather widely sinuous, and the marginal stria is widely interrupted, not reaching the sinuosity, but across the mesosternum there is an independent arched stria which reaches its base and is continued laterally and sinuously along the metasternum.

Hister asoka, sp. n.

Ovalis, convexus, niger, nitidus; fronte impunctata, stria in medio anguste interrupta; pronoto utrinque grosse punctato; elytris striis 1–4 integris, 5 abbreviata; propygidio pygidioque punctulatis.

L 8½ mill.

Oval, convex, black and shining; the head impunctate, frontal stria semicircular but slightly interrupted in the middle; the thorax with large punctures laterally, punctures most numerous behind the anterior angles, a little before the middle on either side is a large but shallow impression, lateral stria almost complete but a little shortened at its base; the elytra, striæ 1–4 complete but the second and fourth do not touch the base, 5 apical nearly dimidiate and sometimes a little broken or punctiform, sutural indicated by fine punctures at and behind the middle, subhumeral dimidiate; the mesosternum is sinuous and marginate; anterior tibiæ 3-dentate.

This species belongs to a section of the genus which should include *Hister ariasi* and *jekeli*, Mars., and *H. aino*, Lew., and they all infest old trees. The species agree in having the inner dorsal striæ more or less fine and punctiform, and *ariasi* and *aino* are similar in having the head punctured behind the frontal stria. The trivial name will recall to memory that of the ruler of India in the third century B.C.

The four species mentioned above would be placed in Motschulsky's genus *Pactolinus* should it ever be characterized and adopted.

Hab. Dehra Dun, United Provinces, India. Found under the bark of spruce by Mr. E. P. Stebbing.

Hister virginiæ, Casey. An example I have received from America labelled *virginiæ* is *Hister merdarius*, Hoffm., a species common to both the Old and New World. Whether it agrees with Casey's type I cannot say.

Hister pyxidatus, Lew. Ann. & Mag. Nat. Hist. iii. p. 282 (1889), n. syn.

Hister pharaonis, Sch. Ent. Nachr. xv. p. 90 (1889), n. syn.
=*Hister montanus*, Mars. Mon. p. 413, p. 10, f. 33 (1857).

I have the type of the first named and a cotype from the author of the second. Marseul's description and figure of *montanus* are very good, but both Schmidt and myself overlooked it.

Hister belti, Lewis, n. n.

Hister castaneus, Lew. Ann. & Mag. Nat. Hist. xv. p. 465 (1885).

This species requires a new name, because *Hololepta castaneus*, Ménétr., 1832, apparently is an older name for *Hister smyrnœus*, Mars., 1854. I have now named it after the captor, Mr. Thomas Belt, whose book 'The Naturalist in Nicaragua' is well known.

Peranus bimaculatus, Linn.

Hister bimaculatus, L., differs from *Hister corvinus*, Germ., which is the type of Thomson's genus *Atholus*, by the characters which distinguish *Peranus*.

Pachycrœrus hyalus, sp. n.

Oblongo-ovatus, parum convexus, virescens, nitidus, pedibus obscure brunneo-rufis; fronte concava, tenuiter punctulata; pronoto undique punctato, stria marginali antice interrupta; elytris striis 5 et subhumerali dimidiatis, 1–4 suturalique integris; propygidio punctato; prosterno bistriato; mesosterno acuminato, marginato; tibiis anticis 5-dentatis, dente apicali bifido.
L. 4 mill.

Oblong oval, rather convex, elytra brassy green, thorax faintly coppery; the head, forehead, and clypeus concave without a transverse stria, surface finely punctulate; the thorax, marginal stria anteriorly fine and slightly interrupted behind the head, surface clearly and evenly punctured; the elytra, striæ, subhumeral and fifth dimidiate, 1–4 complete, sutural almost touches the base and it has an adjacent basal puncture; the propygidium is wholly punctured like the thorax; the pygidium has smaller points and is somewhat smooth at the apex; the prosternum is bistriate, striæ meeting anteriorly and slightly widen out to the base; the mesosternum is rather sharply acuminate and marginate; the anterior tibiæ are 5-dentate, apical tooth bifid.

This species is rather smaller than *cyanipennis*, Fåhr., and differs by the thorax being wholly punctate, by the sutural stria almost touching the base, the mesosternum is more sharply acuminate and marginate, and the prosternal striæ are wider apart especially near and at the base. I have not seen *P. congonis*, Sch., but it is elongate and has a distinct transverse frontal stria.

Hab. Fernand-Vaz, French Congo (*L. Fea*, 1902). In the Genoa Museum and my own collection.

Chlamydopsis (*Byzenia*) *formicicola*, King, 1869.

The name of this species appears as a synonym of *C. striatella*, Westw., in my catalogue of 1905, but I have recently received an example of King's species from Mr. A. M. Lea and I find that it is distinctly different. It differs by being darker in colour, less quadrate in form (the elytra being relatively longer), by the thorax being acutely angulate at the anterior angles and the surface is less opaque and less distinctly granulate, by the elytra having the two elevations behind the scutellum much less oblique and somewhat acutely pointed at their ends. The elevations in *striatella* are somewhat short, distinctly divided in the middle, oblique, and end on each side obtusely. *C. inquilina*, Lew., differs from both species by being nitid and the thorax is much less transverse and is parallel laterally, the edges in front and at the sides being uniformly and more strongly elevated; the elytra also have the elevations behind the scutellum perfectly transverse, not oblique, and they are longer and acute at their ends and there is scarcely any discernible median partition. The legs of *inquilina* are more robust, a character especially obvious at the bases of the tibiæ, and the median angles of the tibiæ are all less acute. My specimens of *inquilina* and *striatella* are from Liverpool, N. S. Wales.

The species of this genus are probably numerous, and I think that the elevations on the elytra behind the scutellum are likely to afford good specific characters. Mr. Lea has sent me a sketch in outline of a most remarkable new species, lately found in Australia, which will require the founding of a new genus for its reception. The head is entirely concealed by its protruding thorax, a structure otherwise only known in the Histeridæ in the genus *Xiphonotus*.

Saprinus œrarius, n. n.

Saprinus œratus, Lew. Ann. & Mag. Nat. Hist. ser. 8, vol. iv. p. 301 (1909), requires a new name, as Erichson employed *œratus* in 1834.

Hypocaccus varians, Sch., 1890.

This species, first discovered in Japan, and latter in China and Ceylon, has now been found in Australia at Sand Islet, Long Reef. Some examples have the marginal stria of the mesosternum interrupted anteriorly. The Australian specimens are in the British Museum; all have the sutural dorsal stria abbreviated. As its name indicates, its sculpture is extremely variable.

Hypocaccus apricarius, Er.

Herr C. Bruch has found this species at Montevideo.

VII.—*Further Additions to the Molluscan Fauna of Central Africa.* By H. B. Preston, F.Z.S.

[Plates IV. & V.]

Helicarion perfragilis, sp. n. (Fig. 1.)

Shell ovate, thin, transparent, shining, amber-colour; whorls 3, rapidly increasing in size, the last dilated below, marked with indistinct growth-lines; sutures scarcely impressed, very narrowly margined; labrum acute; aperture large, ovate, elongately dilated.

Alt. 4·25, diam. maj. 8·25, diam. min. 6 mm.

Aperture: alt. 4, diam. 5 mm.

Hab. Maringo Plateaux, Belgian Congo.

Thapsia gereti, sp. n. (Fig. 2.)

Shell discoidal, thin, hyaline, rather opaque, pale greyish white; spire somewhat elevated; whorls 5½, marked with transverse growth-lines, which become more noticeable on the base; sutures impressed, narrowly margined; umbilicus narrow, deep; peristome descending very obliquely; labrum simple, acute; aperture obliquely broadly lunate.

Alt. 3, diam. maj. 5·75, diam. min. 5 mm.

Aperture: alt. 2, diam. 2 mm.

Hab. Maringo Plateaux, Belgian Congo.

Allied to *T. mixta*, Smith, from Chiradzulu, Nyika Plateau, British Central Africa, but more closely coiled and with the spire more elevated than in that species.

Subulina maringoensis, sp. n. (Fig. 3.)

Shell subulate, shining, thin, yellowish horn-colour; whorls 9, somewhat convex, sculptured with fine transverse striæ, which are more marked immediately below the sutures; sutures deeply impressed, crenellate; columella arched, curved, obliquely truncate; labrum acute; aperture inversely auriform.

Alt. 14, diam. maj. 3·5 mm.

Aperture: alt. 2·25, diam. 1·25 mm.

Hab. Maringo Plateaux, Belgian Congo.

The species may be compared with *S. octona*, Linn., but is much less blunt at the apex and has considerably more convex whorls.

Limnæa anceyana, sp. n. (Fig. 4.)

Shell fusiformly ovate, thin, semitransparent, pale yellowish horn-colour; whorls 5, rapidly increasing in size, the last somewhat laterally contracted, marked irregularly with lines of growth; sutures well impressed; columella descending obliquely, twisted and diffused into a very thin callus which reaches the lip above; labrum acute; aperture elongately ovate.

Alt. 19, diam. maj. 7, diam. min. 5 mm.

Aperture: alt. 9, diam. 5 mm.

Hab. Maringo River, Belgian Congo.

Unio angoniensis, sp. n. (Fig. 5.)

Shell ovate, slightly angled posteriorly, covered with a blackish-brown laminiferous periostracum; sculptured with closely set, irregular, concentric growth-lines, and posteriorly with curved, transverse, interrupted, slightly nodulous riblets; umbones much eroded, rather large, moderately prominent; dorsal margin somewhat ascending, scarcely arched; ventral margin nearly straight; anterior side abruptly rounded; posterior side sloping above, then angled and descending sharply below; lateral teeth elongate, curved; cardinal tooth in right valve elongate, erect and jagged anteriorly, partially cleft posteriorly; cardinal tooth in left valve somewhat triangular, broad, tuberculous in the middle, erect and jagged at the sides; anterior adductor scars deeply impressed, ovate; posterior adductor scars light; interior of shell nacreous, pink anteriorly, livid bluish posteriorly.

Long. 26, lat. 39 mm.

Hab. Angoniland, British Central Africa, to the south o Lake Nyassa.

Unio charon, sp. n. (Fig. 6.)

Shell elongately ovate, slightly gaping at both sides, covered with a black periostracum, corrugately sculptured towards the umbonal region and marked below with irregular concentric ridges; umbones eroded, moderately large, not prominent; dorsal margin curved; ventral margin slightly constricted in the middle, otherwise straight; anterior side rather produced, angularly rounded; posterior side elongately produced, sharply rounded; lateral teeth in both valves elongate, curved; cardinal tooth in right valve elongate, rather fine, rising considerably in the middle; cardinal tooth in left valve almost obsolete, serrated anteriorly; anterior adductor scars deep, somewhat square in shape; posterior adductor scars scarcely impressed; interior of shell nacreous, bluish white.

Long. 26·5, lat. 52 mm.

Hab. Silongwe, British Central Africa.

Unio vicinus, sp. n. (Fig. 7.)

Shell differing from *U. charon* by its narrower form and somewhat more acuminate posterior side, lighter texture, much smoother concentric sculpture, and paler colour, the periostracum being of a pale yellowish-brown colour; the muscular scars are much larger, and, in the case of the anterior adductor, more deeply impressed.

Long. 24, lat. 52 mm.

Hab. Silongwe, British Central Africa.

Unio choziensis, sp. n. (Fig. 8.)

Shell small, squarely ovate, moderately convex, covered with a blackish-brown periostracum, sculptured with fine concentric striæ and rather coarse, transverse, corrugated ridges, which become finer posteriorly; umbones not prominent; dorsal margin sloping in an anterior direction; ventral margin slightly rounded; anterior side descending somewhat abruptly; posterior side rather acuminately rounded; lateral teeth elongate, straight; cardinal tooth in right valve weak, jagged, erect anteriorly, bifurcate posteriorly; cardinal teeth in left valve elongate, finely jagged, cleft anteriorly; muscular scars deeply impressed anteriorly, scarcely apparent posteriorly; interior of shell iridescent, bluish white.

Long. 16·25, lat. 25 mm.

Hab. Chozi River, a tributary of the Chambzi, flowing into Lake Bangweolo from the east.

Unio gereti, sp. n. (Fig. 9.)

Shell ovate, somewhat tumid, covered with a dark brown silky periostracum and sculptured with fine rather closely set concentric lines of growth; umbones slightly eroded, prominent; dorsal margin nearly straight; ventral margin scarcely rounded; anterior side angled above, obtusely rounded below; posterior side sloping obliquely, sharply rounded below; lateral teeth short anteriorly, elongately curved posteriorly; anterior cardinal tooth in right valve short, rather square, erect, jagged, incised on the outer side; median cardinal tooth very small; posterior cardinal rather small, projecting; anterior cardinal in left valve bluntly triangular, incised posteriorly; posterior cardinal bifurcate, thus presenting the appearance of a double tooth; anterior adductor scars ovate, well impressed; posterior adductor scars moderately impressed; interior of shell pale bluish white, somewhat iridescent.

Long. 36·5, lat. 61 mm.

Hab. Lake Tanganyika.

Unio mashonæ, sp. n. (Fig. 10.)

Shell elongately ovate, rather tumid, covered with a dark blackish-brown periostracum, sculptured with somewhat coarse and irregular concentric striæ, angled posteriorly; umbones rather large, prominent though much eroded; dorsal margin nearly straight; ventral margin almost straight, but very slightly constricted towards the middle; anterior side rounded above, sloping below; posterior side produced, bluntly acuminate; anterior lateral teeth very short; posterior laterals long and coarse; cardinal teeth in right valve wedge-shaped, solid in left valve, broad, serrated; anterior adductor scar ovate, moderately deep; posterior adductor scar narrowly fan-shaped, well impressed; palleal impression coarse, nacreous, pinkish in colour; outer margins of interior of shell nacreous, bluish white.

Long. 80, lat. 37·5 mm.

Hab. A sluit about 16 miles from Eukeldoorn, Mashonaland (*Miss Ella Sharpe-Youngs*).

Type in British Museum.

Unio shireensis, sp. n. (Fig. 11.)

Shell ovate, moderately tumid, covered with a pale, reddish-brown, rather thin periostracum, which becomes thicker, foliaceous, and darker in colour posteriorly, both valves sculptured with coarse concentric growth-lines; umbones much eroded, rather small; dorsal margin somewhat arched; ventral margin slightly rounded; anterior side rounded above, sloping below; posterior side bluntly rostrate; anterior lateral teeth very short; posterior laterals long and straight, slightly serrated; cardinal teeth curved, massive, jagged, especially in left valve; anterior adductor scar deeply excavated, squarish; posterior adductor scar irregularly triangular, not deeply impressed; interior of shell iridescent, pale pinkish, shading to bluish white towards the ventral, anterior, and posterior margins.

Long. 21, lat. 37 mm.

Hab. Shiré River, at a point from 3 to 4 kilometres to the south of Lake Nyassa (*Mgr. Lechaptois*).

Mutela opalescens, sp. n. (Fig. 12.)

Shell moderately thin, irregularly rectangular, posteriorly angled, covered with a thin olive-brown periostracum, sculptured with fine irregular lines of growth and fine, transverse, radiate striæ, which are more apparent anteriorly; umbones eroded, very small, flattish; dorsal margin ascending, anteriorly straight, posteriorly very slightly curved at the top of an almost wing-like expansion; ventral margin scarcely rounded, very slightly constricted towards the middle; anterior side short, descending obliquely, somewhat excavated; posterior side produced below, bluntly rounded; hinge-teeth obsolete; adductor scars moderately impressed; palleal impression rosy, iridescent pink; outer margins opalescent, the radiate striæ very noticeable in the interior of the shell.

Long. 73, lat. 35 mm.

Hab. Shiré River, at a point from 3 to 4 kilometres to the south of Lake Nyassa (*Mgr. Lechaptois*).

In places where the periostracum is lacking, through process of erosion, the shell appears to be highly iridescent.

Mutela cuneata, sp. n. (Fig. 13.)

Shell differing from *M. opalescens* by its narrower and more elongate form, much more solid texture, and in the adductor and other scars in both valves being much more deeply impressed; the interior of the shell is more nacreous and presents a finely granular appearance, which is not the case in *M. opalescens*; moreover the transverse striæ do not appear in the interior of the shell as in that species.

Long. (of type specimen) 36, lat. 81 mm.

Hab. Karonga, northern end of Lake Nyassa (*Mgr. Lechaptois*).

I have before me a good series of this shell, the largest specimen measuring 42·5 by 97 mm.

Spatha approximans, sp. n. (Fig. 14.)

Shell closely allied to *S. nyassensis*, Lea [*], but broader posteriorly, more acuminate, and covered with a periostracum much paler in colour; the interior of the shell is exceedingly finely granulate.

Long. 64, lat. 100 mm.

Hab. Shiré River, at a point from 3 to 4 kilometres to the south of Lake Nyassa (*Mgr. Lechaptois*).

Spatha bertilloniana, sp. n. (Fig. 15.)

Shell moderately flat, rectangularly ovate, solid, scarcely angled posteriorly, covered with a fine reddish-chestnut periostracum, sculptured with coarse, broad, somewhat distant, concentric growth-lines and very fine, transverse, radiate striæ; umbones small, not prominent; dorsal margin nearly straight, somewhat ascending; ventral margin constricted towards the middle; anterior side squarely rounded; posterior side broadly produced, bluntly acuminate; anterior adductor scars ovate, well impressed; posterior adductor scars broadly ovate, moderately impressed; infra-umbonal visceral scar in right valve broad, in left valve small, short, and deep; palleal margin coarsely defined; interior of shell nacreous, pinkish white, iridescent, especially towards the posterior side, sculptured with fine, interlacing, irregular, wavy striæ converging towards the centre of the shell.

Long. 51·5, lat. 97 mm.

Hab. Karonga, north end of Lake Nyassa.

A very handsome species, of which the internal sculpture is most curious and may, in a measure, be compared to the markings of finger-prints; in the single specimen before me this remarkable sculpture is much more apparent in the right than in the left valve.

EXPLANATION OF THE PLATES.

Plate IV.

Fig. 1. *Helicarion perfragilis*, sp. n.
Fig. 2. *Thapsia gereti*, sp. n.
Fig. 3. *Subulina maringoensis*, sp. n.

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[*] Proc. Zool. Soc. London, 1877, p. 719.

Fig. 4. *Limnæa anceyana*, sp. n.
Fig. 5. *Unio angoniensis*, sp. n.
Fig. 6. —— *charon*, sp. n.
Fig. 7. —— *vicinus*, sp. n.
Fig. 8. —— *choziensis*, sp. n.
Fig. 9. —— *gereti*, sp. n.
Fig. 10. —— *mashonæ*, sp. n.
Fig. 11. —— *shireensis*, sp. n.
Fig. 12. *Mutela opalescens*, sp. n.

PLATE V.

Fig. 13. *Mutela cuneata*, sp. n.
Fig. 14. *Spatha approximans*, sp. n.
Fig. 15. —— *bertilloniana*, sp. n.

VIII.—*On a few new Bornean Beetles of the Rutelid Genera* Mimela *and* Anomala. By GILBERT J. ARROW.

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THE British Museum collection contains a very considerable number of species of the great genus *Anomala* from Borneo, few of which have at present been described. Some of the more interesting forms are here characterized and two species of the closely related genus *Mimela* are added. The group of species at the end of this paper form a new section of *Anomala*, distinguished by a sexual difference in the pygidium, of a kind hitherto unknown.

Mimela pallidicauda, sp. n.

Læte flava, lævissime æneo-micans, fronte, pronoto (lateribus exceptis), elytris, dorsoque, pygidii apice excepto, saturate viridibus, partibus illis flavo-viridibus, tarsis posticis viridi-æneis; ovata, sat convexa, modice nitida; clypeo lato, crebre punctato, fronte irregulariter punctata; pronoto fortiter, lateribus minus crebre, punctato, marginibus lateralibus post medium fere angulatis, angulis posticis rotundatis; scutello distincte punctato; elytris fortiter seriato-punctatis, interstitio secundo lato, irregulariter punctato; pygidio nudo, fortiter sat crebre punctato; mesosterno haud producto, metasterni lateribus dense punctatis, griseo-pubescentibus, medio lævi; abdomine subtus punctato; tibiis anticis fortiter bidentatis.

Long. 15 mm.; lat. max. 9 mm.

Hab. Labuan. Sumatra.

I have seen only two female specimens, the type in the

British Museum having been brought from Labuan, while the specimen from Sumatra was taken by Dr. A. R. Wallace and is in the Oxford Museum.

The colour is a deep grass-green, the legs and lower surface bright yellow, with a faint metallic-green lustre, and the clypeus, the sides of the pronotum, and the posterior part of the pygidium light green-yellow. The species is similar in size and general appearance to *M. xanthorrhina*, Hope, but of a deeper and richer green colour; while the elytra are not pale-bordered and are rather less coarsely and more evenly punctured, without costæ.

Mimela margarita, sp. n.

Ovalis, elongata, convexa, nitida, corpore supra roseo-viridi, margaritaceo, subtus cum pedibus testaceo, leviter aurulento; clypeo rugose punctato, fronte prothoraceque subtiliter sat æqualiter punctatis, hoc brevi, lateribus arcuatis, angulis anticis acutis, posticis rotundatis; scutello lævissime punctato; elytris subtiliter sat regulariter seriato-punctatis, interstitio secundo irregulariter punctato; pygidio ventrisque segmento ultimo grossissime crebre punctatis; corpore subtus lateribus griseo-pubescenti, metasterni medio lævi, abdomine punctato; mesosterno haud producto; tibiis anticis fortiter bidentatis.

Long. 16·5 mm.; lat. max. 8·5 mm.

Hab. N. Borneo: Kina Balu.

I have seen only the single type specimen taken by Whitehead. It is an unusually elongate species, with the upper surface of a pale green colour suffused with a delicate pearly-pink lustre, changing according to the incidence of the light. The head and pronotum are more distinctly green than the elytra; the pygidium is of the same colour as the latter and is very coarsely and closely punctured. The puncturation of the rest of the upper surface is very fine.

Anomala flutipes, sp. n.

Flavo-testacea, rufo-brunneo-maculata, prothoracis plagis duabus, elytrorum humeris, regione circumscutellari parteque postica (linea irregulariter obliqua delimitata), pygidio, pedibus partibusque inferioribus aut pallidis aut obscuris; ovata, sat lata, ubique profundissime punctata, capite dense et rugose punctato; pronoto grosse punctato, linea media lævi, lateribus confluenter punctatis; scutello minute punctato; elytris fortiter, hic et illic irregulariter et rugose, punctato-striatis; pygidio grosse et rugose punctato; corpore subtus subtilius punctato, lateribus haud dense griseo-hirsuto; mesosterno haud producto; metasterni lateribus dense punctatis; tibiis anticis bidontatis, posticis basi angustis, deinde inflatis.

Long. 14 mm.; lat. max. 9 mm.

Hab. Sarawak: Matang (3600 ft., March–June).

This peculiar insect was taken in numbers by Mr. R. Shelford's native collectors. It is one of the best-marked species of the enormous genus *Anomala*, and cannot be compared to any other. It is a short, compactly built, species, with the hind tibia swollen in the middle and tapering to a slender footstalk at its attachment to the femur. The elytra have in both sexes a slight lateral depression behind the shoulder and are widest just behind this. The posterior half, the shoulders, and the region adjacent to the scutellum are rather bright reddish chocolate, and the prothorax bears two large spots of the same colour. The entire upper surface is very deeply and strongly punctured.

Anomala prolixa, sp. n.

Castaneo-brunnea, leviter æneo-micans, segmentorum abdominalium lateribus flavo-spilotis, corpore elongato, antice angustato, supra nitidissimo, pectore dense, abdomine pygidioque postice parcius, flavo-hirsutis; capite subopaco, rugose punctato; prothorace modice punctato, medio leviter sulcato, lateribus medio angulatis, angulis posticis fere productis; scutello lateribus distincte punctatis; elytris longis, fere ad apices dilatatis, antice disperse subtiliter punctatis, deinde magis regulariter, postice striato-punctatis, late membranaceo-marginatis; pygidio omnino rugoso; mesosterno antice haud prominenti; tibiis anticis bidentatis.

Long. 23 mm.; lat. max. 11·5–13 mm.

Hab. **N. Borneo: Kina Balu (*Whitehead*).**

I have seen only four female examples, which, like the two preceding species, formed part of the Alexander Fry Bequest to the British Museum. The shape of this insect is peculiar Among the metallic species of *Anomala* it is unusually elongate, and the elytra gradually widen from the shoulders almost to the end. Their membranous fringes are wide and conspicuous, but the line of junction with the elytra becomes indefinite at the hinder part. The prothorax is rather small in proportion, rather abruptly narrowed towards the front angles, with the hind angles sharp. Each abdominal segment has a large yellow spot on each side, and an indistinct spot is sometimes traceable also on each side of the pygidium, which is prominent, rather finely rugose, and furnished with long hairs upon its posterior half.

Anomala soror, sp. n.

Castaneo-brunnea, aureo-micans, corpore subtus rufo-cupreo, segmentorum abdominalium lateribus flavo-spilotis; elongata, nitidissima, pectore sat dense, abdominis lateribus pygidioque postice parcius flavo-hirsutis; clypeo rugoso, fronte crebre punctata, prothorace distincte et æqualiter punctato; scutello ubique minute punctato; elytris subtiliter seriato-punctatis, angustissime membranaceo-marginatis; pygidio sat nitido, grossissime et confluenter punctato; mesosterno haud prominenti; tibiis anticis bidentatis.
Long. 19 mm.; lat. max. 10 mm.

Hab. N. Borneo: Kina Balu (*Whitehead*).

A single female specimen was taken with the preceding species, to which it has the closest resemblance. It is a little smaller, of a similar elongate shape, but with the elytra less dilated behind, the hind angles of the prothorax less sharp, and the puncturation of the pronotum, scutellum, and elytra a little stronger and more evenly distributed. The coloration is exactly similar, but the quite different sculpture of the pygidium and the narrow membranous fringe to the elytra readily distinguish the present species.

It is remarkable to find two species so closely related inhabiting the same locality.

Anomala matanga, sp. n.

Testacea, capite, prothoracis medio, scutello (medio excepto), pectoreque partim metallico-viridibus, abdomine, tibiis tarsisque cupreis, elytrorum marginibus omnibus punctorumque fascia transversim nigris; elongata, deplanata, antice et postice attenuata, sat nitida; capite toto dense punctato, clypeo fere semicirculari; prothorace crebre punctato, punctis paulo transversis; elytris inæqualiter sulcatis, disperse punctulatis, postice fere planatis, separatim arcuatis; pygidio prominenti, transverse haud crebre rugoso-punctato, parce setoso; pectore fere nudo, abdomine parce griseo-hirto; mesosterno haud producto; coxis posticis latis, intus angulatim retro productis; tarsis posticis elongatis, quam tibiis multo longioribus; tibiis anticis bidentatis.
Long. 11 mm.; lat. max. 5 mm.

Hab. Sarawak: Matang (3600 ft., June 1900).

This small species, of which there are two males in our collection, is of very peculiar form. It is long and depressed, with the elytra flattened, the abdomen tapering and largely exposed behind the elytra, and the hind legs very long and slender. It is prettily marked, entirely metallic, except the elytra, which are testaceous, with black margins and four median black spots upon each, forming longitudinal pairs, with a pale spot between each pair. There is sometimes a smaller black spot a little anteriorly. The pronotum and scutellum are bright green, the latter with a central yellow spot, the former with a yellow lateral border continued almost round the base.

Anomala pulicaris, sp. n.

Metallico-testacea vel ænea, elytris nigris, maculis plerumque flavis transversis ante medium, pronoti margine laterali pallido, postice plus minusve producto, scutelli medio plerumque flavo-maculato; parva, elongata, paulo deplanata, postice attenuata, corpore subtus toto parce griseo-piloso; capite crebro punctato, clypeo fere semicirculari; prothorace modice lato, subtiliter sat æqualiter punctato, punctis paulo transversis, lateribus arcuatis, angulis posticis distinctis; scutello toto punctato; elytris inæqualiter sulcatis, disperse punctulatis, postice parum convexis, separatim arcuatis; pygidio prominenti, leviter plicato, sicut corpore subtus parce hirsuto; mesosterno haud producto; tibiis anticis bidentatis; pedibus posticis validis, coxis latis, intus angulatim retro productis, tarsis longis.

Long. 7·5 mm.; lat. max. 3·5 mm.

Hab. N. Borneo: Kina Balu (*Whitehead*).

The Museum collection contains two males and one female, all different in coloration. In the female the head and pronotum are yellowish-green, with the clypeus and the margins of the pronotum paler, and the whole lower surface, with the pygidium and legs, are golden, only the hind tibiæ being golden-green. In the males the head and pronotum, except the outer margins of the latter, are very deep green, as well as all the tibiæ and tarsi. In one specimen the abdomen is also dark and the pale spots are absent from the elytra. In all the specimens the elytra alone are non-metallic, and the spots, when present, consist of a pair very near the suture before the middle, a smaller anterior pair distant from one another, and a posterior pair still more so.

A. pulicaris is closely related to *A. matanga*, but is very small, with the prothorax rather more convex and less narrowed in front.

Anomala quadrigemina, sp. n.

Pallide testacea, verticis maculis duabus, prothoracis maculis quatuor discoidalibus, sæpe longitudinaliter confluentibus, elytrisque punctis quatuor post-scutellaribus, his nonnunquam omnibus conjugatis, propygidio ventrisque medio plerumque rufo-piceis;

ovalis, convexa, sat nitida, capite crebre punctato, clypei margine omnino arcuato; prothorace fortiter et crebre punctato, lateribus arcuatis, angulis posticis rotundatis; scutello bene punctato; elytris profunde punctato-striatis; pygidio crebre et grosse punctato; corpore subtus fere nudo, modice punctato; mesosterno haud producto; tibiis anticis fortiter bidentatis.

Long. 7 mm.; lat. max. 4–4·5 mm.

Hab. North Borneo: Labuan, Sandakan.

This is another small and rather variable species. It is pale and not at all metallic, with reddish-brown markings, usually consisting of two spots upon the forehead, four upon the disk of the prothorax, and four forming a square behind the scutellum, together with the propygidium and the greater part of the abdomen beneath. There may be in addition on each side a lateral prothoracic spot, one on the shoulder, one behind it, and one near the apex of the elytron. The markings may partially or entirely disappear, and, on the other hand, sometimes increase and cover a large part of the surface. The discoidal thoracic spots on each side then unite, leaving a narrow pale median line, and the posterior pair of elytral spots develop into a large patch, leaving free only the region adjoining the scutellum (enclosing the anterior pair of spots) and an apical border.

Anomala felicia, sp. n.

Saturate viridi-cuprea, prothoracis lateribus, pygidio, femoribusque plerumque, pectoreque nonnunquam, aureo-flavis; elongato-ovata, corpore subtus haud dense flavo-pubescente; capite rugose punctato, clypeo lato, margine rotundato; prothorace brevi, æqualiter crebre punctato, omnino marginato, angulis anticis acutis, posticis obtusis; scutello bene punctato; elytris profunde et fortiter punctato-striatis, striis inæqualibus, secunda antice disrupta; pygidio grosse vix rugose punctato; metasterni lateribus dense, abdomineque toto disperse sed fortiter, punctato; mesosterno haud producto; tibiis anticis fortiter bidentatis.

Long. 11–13 mm.; lat. max. 6–7 mm.

Hab. Sarawak: Penrissen. N. Borneo: Kina Balu. E. Borneo: Sanga Sanga.

This seems to be a common and widely distributed Bornean species. It is of similar size and appearance to *A. assimilis*, Boisd., and *A. æneiventris*, Fairm., but the prothorax is shorter and less narrowed in front, and the pygidium is without hair and coarsely pitted instead of finely rugose.

The four species which follow form, with others, a group of excessively similar forms characterized by a peculiar difference between the sexes. In the males the pygidium is very finely rugose and quite opaque, while in the females it is shining and punctured. All the species are bronzy and finely and closely punctured above, the elytra a little less densely punctured than the pronotum and entirely without striæ. The sides of the body are hairy beneath and the pygidium bears scanty hairs. There is no sternal process and the front tibiæ are bidentate.

Euchlora aureola, Hope, described from a single male, is a member of this group. Both sexes were found by Doherty at Perak. It is distinguished from all the following species by its very broad and conspicuous elytral membrane; but all the species of the group are so extremely close in their external characters that the examination of the genitalia of the males is necessary for their certain discrimination.

Anomala silama, sp. n.

Viridi-cuprea, prothoracis marginibus lateralibus vage pallidioribus, corpore subtus femoribusque cupreo-flavis, tibiis tarsisque rufo-cupreis; elongato-ovata, convexa, corpore supra toto crebro punctato, prothoracis angulis anticis acutis, paulo productis, pygidio parcissime ciliato:

♂, clypeo toto rugoso, pygidio minutissime rugoso, forcipis lobis dorsalibus brevibus, apice valde inflexis, subtus basi haud approximatis:

♀, clypeo dense punctato, pygidio modice, paulo transverse, punctato.

Long. 22–23·5 mm.; lat. max. 11·5–13 mm.

Hab. N. Borneo: Silam (*S. B. J. Skertchley*). E. Borneo: Moorjawa (*H. D. Jensen*).

The colour is a deep coppery green like that of *A. aureola*, Hope, but the lower surface and femora are yellowish, with a slight metallic lustre, and the tibiæ and tarsi fiery red. The extreme lateral edges of the pronotum are also of a yellowish tinge. The shape is more elongate than that of *A. aureola* or of the two following species, and the front angles of the thorax are a little produced. The clypeus is rugose in the male and densely but distinctly punctured in the female. The pygidium bears only a few inconspicuous hairs, and is very finely granulated in the male, and punctured, not very coarsely, in the female.

Anomala posticalis, sp. n.

Obscure cuprea, femoribus castaneis, metallico-micantibus, tibiis

tarsisque viridi-æneis; ovata, modice lata, convexa, corpore supra toto crebre punctato, elytris punctorum paulo majorum seriebus aliquibus præbentibus, prothorace modice angusto, angulis anticis acutis, paulo productis, pygidio longe hirto:
♂, clypeo toto rugoso, pygidio opaco, minute rugoso, forcipis lobis dorsalibus brevibus, apice emarginatis, haud inflexis, subtus basi productis, approximatis:
♀, clypeo dense punctato, pygidio nitido, grosse punctato.
Long. 22–24 mm.; lat. max. 13–14 mm.

Hab. Sarawak: P. Burong (*R. Shelford*, April), Srai (*J. E. Lewis*, May).

This is a large ovate form, bronzy green above and beneath, with the femora reddish and the tibiæ and tarsi dark green. The pronotum is moderately long and tapering, with the front angles a little produced. The elytra bear several longitudinal rows of punctures a little larger than the rest. The clypeus is rugose in the male and densely punctured in the female, and the pygidium is thinly clothed with long hairs, finely granulated in the male and very coarsely punctured in the female.

Anomala biformis, sp. n.

Rufo-cuprea, nitida, corpore subtus viridiore, pedibus igneo cupreis; sat late ovata, convexa, corpore supra crebre punctato, utriusque sexus clypeo omnino rugoso, prothoracis angulis anticis acutis, haud productis, pygidio parce ciliato:
♂, pygidio opaco, rugoso, forcipis lobis dorsalibus longis, apice haud inflexis, subtus basi productis, approximatis:
♀, pygidio nitido, grosse punctato.
Long. 17–21 mm.; lat. max. 10–12 mm.

Hab. S.E. Borneo: Banjermassin.

A. biformis is rather smaller than the two foregoing species, rather broadly oval in shape, and shining coppery red above, the colour being like that of *A. limata*, Cand., and *A. cantori*, Hope. The lower surface is more greenish and the legs are fiery red. The clypeus is entirely rugose in both sexes, the pygidium very thinly hairy, densely granular in the male and very coarsely punctured in the female. The front angles of the thorax are less acuminate than in the allied forms.

Anomala whiteheadi, sp. n.

Viridi-cuprea, pedibus igneo-cupreis; elongato-ovata, convexa, corpore supra toto crebre punctato, prothoracis angulis anticis modice acutis, parum productis, pygidio parcissime ciliato:

♂, pygidio dense rugoso, forcipis lobis dorsalibus longis, apice inflexis, subtus basi productis, approximatis.

Long. 21 mm.; lat. max. 11·5 mm.

Hab. North Borneo: Kina Balu (*Whitehead*).

I have seen only two male examples of this. Like *A. biformis*, it has the lower surface of the body coppery green and the legs metallic crimson, but the upper surface is more green and the body is proportionately narrower.

IX.—*Notes on Fossorial Hymenoptera.*—II.

By Rowland E. Turner, F.Z.S., F.E.S.

On a Collection from the Solomon Islands.

The species described here were collected by Mr. W. W. Froggatt, of Sydney, and sent to me for identification. One or two were sent to the British Museum by Mr. Woodford many years ago. As might be expected, they are nearly allied to New Guinea species, and many wide-ranging species were included, a list of which will be published by Mr. Froggatt.

Thynnus barbarus, sp. n.

♂. Clypeus large, very broadly truncate at the apex, the angles not produced, longitudinally striated, deeply punctured between the striæ, pointed at the base and joined by a very short narrow carina to the broadly rounded apex of the inter-antennal carina. Labrum finely punctured and ciliate at the apex, narrowly truncate on the apical margin, not emarginate or bilobed, projecting much beyond the clypeus. Head finely punctured rugulose, a deep frontal sulcus not reaching the anterior ocellus, the space between the posterior ocelli and the eyes shining and almost smooth. Antennæ of almost even thickness throughout, shorter than the thorax and median segment combined. Thorax and abdomen closely punctured, most finely and closely on the pronotum and sides of the mesonotum, pleuræ finely punctured. Pronotum narrowed anteriorly; the anterior margin almost as wide as the head, raised, with a transverse groove behind it. Scutellum large, very broadly rounded at the apex and very feebly subtuberculate in the middle of the apical margin. Median segment obliquely truncate from the postscutellum, the surface of the truncation finely rugulose. Abdomen elongate-conical, the first segment truncate at the base; sixth ventral segment with a spine on each side at the apical angles; seventh dorsal segment produced into a flattened plate, longitudinally striated and narrowly truncate at the apex. Hypopygium with a spine on each side near the base and another at each of the apical angles and a strong apical spine, obliquely striated above. First ventral segment not carinate and not separated deeply from the second. Third abscissa of the radius half as long again as the second; first recurrent nervure received rather near the apex of the second cubital cell, second at one-quarter from the base of the third cubital cell.

Black; the orbits of the eyes interrupted at the summit and a small spot on each side on dorsal abdominal segments 4–5 and of ventral segments 2–5 pale yellow; the spots on the dorsal segments sometimes absent. Wings pale fusco-hyaline, nervures black.

Length 21, exp. 39 mm.

♀. Clypeus transverse, punctured, without a carina; mandibles falcate, deeply grooved above. Eyes not touching the base of the mandibles; the antennæ inserted further from each other than from the eyes; a deep shining depression above the base of the antennæ, extending to the eyes, but not reaching halfway to the vertex. Head deeply and closely punctured, more than half as broad again as long, somewhat flattened, the vertex broadly smooth and shining. Pronotum coarsely punctured, with an obscure, longitudinal, median carina, about one-third broader than long, rectangular, the anterior margin with a row of long hairs; scutellum small, finely punctured and clothed with long hairs; median segment shorter than the scutellum, smooth and shining and obliquely truncate posteriorly. First abdominal segment truncate anteriorly, the dorsal surface finely and closely punctured, clothed with long hairs in the middle, the apical margin narrowly depressed; second segment with about twelve transverse carinæ, low at the base, increasing in height to the apex, segments 3–5 smooth and shining; ventral segments shallowly punctured, the fifth coarsely longitudinally striated. Pygidium truncate posteriorly, sharply contracted at the base of the truncation, the dorsal plate trilobed, with arched carinæ at the base, the lateral lobes almost straight on the outer margin, the angles slightly prominent; ventral plate projecting beyond the dorsal, rounded, with an emargination at the apex, the lateral margins feebly serrate. Anterior tibiæ strongly emarginate at the apex, intermediate tibiæ thickened, the first joint of the intermediate tarsi moderately thickened and spinose. Tarsal ungues bidentate.

Black, the pubescence cinereous; a spot on each side of the first dorsal abdominal segment, a smaller one on each side of the second, and a narrow transverse band narrowly interrupted in the middle near the apex of the third segment yellow. Spines of the tibiæ and tarsi dark fusco-ferruginous.

Length 16 mm.

Hab. Gavuta, Solomon Islands (*Froggatt*). 2 ♂, 1 ♀.

Allied to *T. serriger*, Sharp, and *T. olivaceus*, Turn., and belongs to the genus *Thynnus* in the most limited sense.

Anoplius (*Episyron*) *froggatti*, sp. n.

♀. Clypeus three times as broad as long, the apical margin transverse, not rounded. Second joint of the flagellum long, the first and second equal in length to the third and fourth combined. Eyes separated on the vertex by a distance about equal to the length of the third joint of the flagellum, the posterior ocelli a little further from each other than from the eyes. Pronotum short, broadly rounded anteriorly, the posterior margin very feebly arched. Scutellum large, slightly convex, broadly rounded at the apex. Median segment as broad at the base as long, slightly narrowed to the apex. Abdomen subsessile, opaque, the sixth dorsal segment narrowly rounded at the apex. Tarsal ungues bidentate, tibiæ spinose. First and third abscissæ of the radius equal, united a little longer than the second, the second cubital cell half as long again as the third on the cubital nervure, the recurrent nervures received by the second and third cubital cells respectively beyond two-thirds from the base; cubitus of the hind wing originating just before the transverse cubital nervure.

Opaque black, the margins of the eyes very narrowly, broadly interrupted on the summit, a spot at the apex of the coxæ and a spot on each side at the base of the third dorsal segment of the abdomen dull creamy white; clypeus and front clothed with fine white pubescence; postscutellum, median segment, and first dorsal segment of the abdomen thinly covered with blue scale-like hairs. Wings hyaline, the apex fuscous from the apex of the radial cell.

Length 11 mm.

Hab. Solomon Islands (*Froggatt*). July.

Very near *papuensis*, Sm., but differs in the clypeus, which is rounded in *papuensis* at the apex; the present species also has the third abscissa of the radius longer and the apical dorsal segment of the abdomen more distinctly rounded at the apex. The coloured marks are more numerous and more extensive on *papuensis*. In the form of the clypeus the present species resembles *lepidohirtus*, Turn., from Queensland, but in that species the median segment is much broader, the third abscissa of the radius shorter, as in *papuensis*, and the recurrent nervures received further from the apex of the cells. The differences are probably of subspecific rather than of specific importance.

Cryptocheilus (*Priocnemis*) *woodfordi*, sp. n.

♀. Clypeus twice as broad as long, slightly convex, porrect and almost transverse at the apex, covered with very fine golden pubescence, with a few scattered punctures each bearing a long fulvous hair, the apical margin smooth. Head covered with fine golden pubescence; eyes very slightly converging towards the vertex, where they are separated by the length of the third and half of the fourth joints of the flagellum, the posterior ocelli twice as far from the eyes as from each other; first and second joints of the flagellum combined almost as long as the third and fourth. Pronotum broadly arched posteriorly, postscutellum strongly raised in the middle, subtuberculate, median segment transversely rugosely striated, with a tubercle on each side at the base. Abdomen shining, slightly pruinose, the second ventral segment with a transverse groove. Tarsal ungues with one tooth before the middle. Second abscissa of the radius equal in length to the third, nearly twice as long as the first; second recurrent nervure received just before one-third from the base of the third cubital cell, first just before the apex of the second cubital cell. Cubital nervure of the hind wing originating just beyond the transverse median nervure, almost interstitial.

Ferruginous; abdomen black; wings entirely fuscous with bright purple-blue gloss.

Length 20–25 mm.

Hab. Rauro, Solomon Islands (*Woodford*).

Very near *fervidus*, Sm., from Aru.

Smith states that the clypeus of *fervidus* is rounded at the apex. This is not the case in a specimen from Dory, New Guinea, identified as *fervidus* by Smith. This is the specimen referred to by him (Journ. Proc. Linn. Soc. iv. p. 120, Suppl. 1860), and has the tarsal ungues bifid not toothed. I have not seen typical *fervidus*, but if the tarsal ungues are toothed the present species will only stand as a geographical race, *C. fervidus* subsp. *woodfordi*. It can be easily distinguished by the absence of the flavo-hyaline patch at the base of the wings.

Cryptocheilus (*Priocnemis*) *salomonis*, sp. n.

♀. Clypeus more than twice as broad as long, slightly convex, almost transverse at the apex; the labrum exposed, broad and transverse. Head, pronotum, and sides of the thorax sparsely clothed with long black hairs; eyes converging very slightly towards the vertex, where they are separated by a distance equal to the length of the third and one-third of the fourth joint of the flagellum, the posterior ocelli a little further from the eyes than from each other. First and second joints of the flagellum a little shorter than the third and fourth combined. Posterior margin of the pronotum strongly arched. Median segment indistinctly transversely striated, with a low blunt tubercle on each side at the base. Abdomen shining, sparsely punctured, the apical segment clothed with stiff fulvous hairs. Third abscissa of the radius as long as the first and second combined; first recurrent nervure received a little before the apex of the second cubital cell, second at middle of the third cubital cell. Cubital nervure of the hind wing interstitial with the transverse median nervure. Posterior tibiæ strongly serrate, tarsal ungues with one tooth. Black; femora, tibiæ, tarsi, and scape ferruginous brown. Wings fuscous, with a strong purple gloss.

Length 24–26 mm.

Hab. Savo, Solomon Islands (*Woodford*).

A specimen sent by Mr. Froggatt from the Solomon Islands, without any more definite locality, has the flagellum wholly ferruginous.

Pseudagenia numeria, Sm., subsp. *mendana*, subsp. n.

♀. Differs from *numeria* in the sculpture of the median segment, which is distinctly transversely striated except at the base; there is also an obscure median sulcus at the base and at the apex. The segment is also a little broader in proportion to the length, and the second joint of the flagellum is a little longer. The second recurrent nervure is received at one-third from the base of the third cubital cell in the present form and at two-fifths from the base in *numeria*. *P. valeria*, Turn., from Queensland, is another subspecies in which the median segment is distinctly margined laterally near the base, and the median sulcus present though obscure; and the first recurrent nervure received before the middle of the second cubital cell, whereas in *numeria* and *mendana* it is received in the middle. In *valeria* the third abscissa of the radius is as long as the second, but it is shorter in the typical form and in *mendana*.

Hab. Solomon Islands (*Froggatt*).

X.—*Rhynchotal Notes.*—LI. By W. L. Distant.

African Pentatomidæ.

Genus Odontotarsus.

Odontotarsus, Lap. Ess. Hém. p. 68 (1832).

Type, *O. purpureolineatus*, Rossi.

Odontotarsus druryi, sp. n.

Head ochraceous, with two central longitudinal piceous fasciæ, the lateral areas strongly greyishly pilose; antennæ with the first and second joints ochraceous, the third piceous ochraceous at base (remainder mutilated in typical specimen); pronotum ochraceous, sparingly coarsely punctate, two central longitudinal fasciæ and two on each lateral area, the outermost of each series more or less margined with greyish, a short black line on each side of the central fasciæ at anterior area, posterior angular areas more or less greyishly pilose; scutellum ochraceous, sparingly darkly punctate, with two central longitudinal sinuate piceous fasciæ, bordered on each side with greyish white, the lateral margins broadly greyish, a semilunate piceous spot inwardly margined with greyish white on each side of base; body beneath ochraceous, more or less greyishly pilose, the sternum strongly pilose, the abdomen less so and thickly darkly punctate; legs ochraceous, more or less greyishly pilose, and with some dark punctures, coxæ piceous.

Form and shape of *O. caudatus*, Burm., but narrower and more elongate, pronotum with the lateral margins oblique, the posterior angles not prominent; apical area of the scutellum centrally sulcate, the extreme apex strongly emarginate, not truncate.

Long. 11½ mm.; exp. pronot. angl. 5 mm.

Hab. N. Rhodesia; Kafue R. (*J. Drury*, S. Afr. Mus.).

This is the first species of *Odontotarsus* described from the Ethiopian Region. It is represented in North Africa, but is there Palæarctic in distribution.

Genus KAYESIA.

Kayesia, Schout. Rhynch. Æthiop. 1, i. p. 114 (1903).

Type, *K. parva*, Schout.

Kayesia nigrolineata, sp. n.

Pale brownish ochraceous, thickly darkly punctate; margins of the pronotal cicatrices and a transverse central spot just behind them, irregular, transverse, and somewhat reticulate lines to the scutellum, and margins to the central lobe of head, black; scutellum with five small basal spots, a short lateral marginal line near base and a somewhat faint central longitudinal line not extending beyond middle, pale ochraceous; head beneath and sternum blackish, abdomen beneath castaneous (imperfectly seen on carded type); coxæ, legs, and rostrum pale ochraceous; femora biannulated with piceous on their anterior areas, bases and apices of tibiæ more or less piceous; rostrum with its apex black and reaching the posterior coxæ; sternum sulcated and thickly coarsely punctate; head with the lateral margins sinuate, the lateral lobes slightly longer than the central lobe, thickly coarsely punctate, eyes prominent; antennæ mutilated in typical specimens, first joint not reaching apex of head, ochraceous; pronotum with the anterior lateral angles acute, prominent, and pale ochraceous, lateral margins strongly sinuate, posterior lateral angles obtusely subprominent.

Long. 5 mm.

Hab. Natal; Durban (*Bell-Marley*).

Genus LEGNOTUS.

Legnotus, Schiödte, in Kröyer, Naturh. Tidsskr. (2) ii. p. 464 (1849).
Gnathoconus, Fieb.
Lalervis, Sign.

Type, *L. melaleucus*, Thunb.

Legnotus expansus.

Adomerus expansus, Sign. Ann. Mus. Civ. Stor. Nat. Genov. 1881, p. 656.

Lalervis expansa, Sign. Ann. Soc. Ent. Fr. 1884, p. 49 (Cydn. pl. xxv. fig. 216).

Gnathoconus elongatus, Dist. Ann. & Mag. Nat. Hist. (7) xiii. p. 349 (1904).
Legnotus elongatus, Bergr. Mém. Soc. Ent. Belg. xv. p. 150 (1908).
Gnathoconus expansus, Schout. Kilimand. Meru Exped. xii. p. 94 (1910).

Hab. Abyssinia; Kilimandjaro; Transvaal.

Schouteden has compared a cotype of my species with the *Lalervis expansa*, Sign., in the Genoa Museum.

Genus ATELOCERA.

Atelocera, Lap. Ess. Hém. p. 63 (1832).

Type, *A. armata*, Lap.

Atelocera attenuata, sp. n.

Head black, the lateral margins, a central longitudinal line anteriorly obsolete, a curved line from near ocelli to before eyes, and a somewhat oblique line on anterior area on each side of the central lobe, ochraceous; pronotum ochraceous mottled with black and with black punctures, more prominently black on the subanterior and sublateral margins, a central pale longitudinal line only distinct on anterior area, the anterior and anterior lateral margins ochraceous; scutellum and corium ochraceous, strongly mottled and punctured with black or piceous, membrane greyish fuliginous with the veins darker; body beneath and legs dark ochraceous or pale castaneous; head beneath, sublateral margins of sternum, coxal spots, apices of femora more or less, apices of tibiæ, the tarsi, and apex of rostrum black; connexivum above and beneath alternately black and ochraceous; antennæ black, second joint (excluding apical area) pale castaneous brown, first joint not reaching apex of head, second considerably longer than third, which is a little longer than fourth; head about as long as pronotum, thickly coarsely punctate between the longitudinal pale lines; pronotum with the lateral margins strongly sinuate, anteriorly finely crenulate, the posterior angles somewhat broadly subangularly produced; abdomen sulcate; rostrum passing the posterior coxæ.

Long. 14–16 mm.; exp. pronot. angl. 7 mm.

Hab. Abyssinia; Shoa (Brit. Mus.). Uganda; Kampola (Coll. Dist.).

Allied to *A. stictica*, Westw., but a more narrow and elongate species, the anterior femora much more shortly spined, head distinctly shorter and comparatively broader.

Atelocera castanea, sp. n.

Pale castaneous, with paler mottlings and darker punctures; head with a black line on each side of the central lobe, and an irregular black spot behind each eye, a somewhat paler central longitudinal fascia traverses the central lobe and reaches base of head; pronotum with a pale central longitudinal fascia, a sublateral marginal black fascia and the margins of the cicatrisant area black; scutellum with a somewhat faint central pale longitudinal line; membrane bronzy piceous; connexivum ochraceous, with quadrate black spots; body beneath and legs reddish ochraceous; disk of head beneath, sternal sutural margins, a sublateral fascia to prosternum, anterior femora and tibiæ beneath, and the tarsi black or piceous; antennæ with the first and second joints brownish ochraceous, third and fourth joints and underside of second joint piceous, first joint almost reaching apex of head, second joint longest, prominently sulcate, third and fourth subequal in length; head about as long as pronotum, excluding the central fasciate line distinctly punctate; pronotum with the lateral margins only moderately sinuate, anteriorly finely crenulate, excluding the central fascia finely darkly punctate; scutellum (excluding the central fasciate line) somewhat thickly darkly punctate, more obscurely punctate on apical area; corium somewhat coarsely and thickly darkly punctate; rostrum just passing the posterior coxæ; anterior femora beneath finely spinose, more prominently so on apical area; abdomen sulcate.

Long. 13½–14 mm.; exp. pronot. angl. 7–7½ mm.

Hab. S.E. Rhodesia; Gaza Land, near Chirinda (*Marshall*, Brit. Mus.).

Allied to *A. obscura*, Dall.

Genus Menaccarus.

Menaccarus, Amy. & Serv. Hist. Hém. p. 100 (1843).

Type, *M. piceus*, Amy. & Serv.

Menaccarus atratus, sp. n.

Black, thickly punctate, with some slight testaceous mottlings or suffusions; body beneath with the disk of the sternum (more or less) and the disk of the abdomen (broadly) testaceous brown, the latter margined on each side with a series of black segmental spots each containing a narrow stramineous spot, lateral areas darker and more darkly punctate; legs black; margins of head, pronotum, and corium longly pilose; head thickly finely punctate; antennæ black, second joint not passing apex of head; pronotum thickly and somewhat finely punctate, with an obscure central longitudinal line, somewhat obscurely transversely depressed near middle; scutellum thickly and a little more coarsely punctate, with an obscure, somewhat paler, central longitudinal line (in some specimens with the central line and the lateral margins distinctly brownish ochraceous); corium thickly punctate; membrane dark fuliginous or piceous, the veins prominent; rostrum brownish testaceous, its apex black and reaching the intermediate coxæ; body beneath more or less finely punctate; posterior tarsi with the basal joint only slightly longer than the following joints together.

Long. 6–7 mm.

Hab. Congo Free State; Katanga, W. of Kambove, Lufira R. (*Neave*, Brit. Mus.).

Genus Pododus.

Pododus, Amy. & Serv. Hist. Hém. p. 101 (1843).

Type, *P. orbicularis*, Burm.

Pododus ovulus.

Sciocoris ovulus, Dall. List Hem. i. p. 132 (1851).
Pododus ovulus, Dist. Ann. & Mag. Nat. Hist. (7) iv. p. 430 (1899).
Pododus striatus, Dist. Ent. Month. Mag. xxviii. p. 238 (1892).

Hab. S. Africa.

When I described *P. striatus* I had not discovered that the *Sciocoris ovulus*, Dall., was a *Pododus*, which I did when rearranging the Brit. Mus. Coll. in 1899 (*supra*).

Is the *Sciocoris mundus*, Germ., a still older name for this species?

Dregea, gen. nov.

Flatly compressed, somewhat broadly ovate; head long, a little shorter than pronotum, considerably narrowed to apex, the lateral margins straight to a little in front of eyes and then a little concavely sinuately narrowed to apex, the lateral lobes considerably longer than the central but not meeting beyond it; the antenniferous tubercles are remote from the lateral margins of the head and inside longitudinal lines through the inner margins of the eyes; antennæ consisting of four joints, the first stouter, not reaching apex of head, second and fourth subequal in length, third longest; rostrum reaching the intermediate coxæ, basal joint not reaching base of head; pronotum about twice as broad as long, anteriorly strongly excavate for the reception of the head, the lateral margins convex, the anterior angles subprominent and subacute, basal margin truncate, the lateral areas distinctly raised and preceded by an irregularly longitudinal broadly grooved impression; scutellum about as long as broad, subtriangular, strongly centrally longitudinally carinate; corium somewhat short and broad, the basal costal margin for nearly half its length moderately laminately upwardly recurved, thence obliquely directed inwardly to apex, the veins prominent; membrane about as long as corium, not reaching apex of abdomen, strongly veined and with a distinct basal cell; connexivum large and broad, visible from the narrowing of the corium, moderately upwardly recurved; sternum centrally longitudinally sulcate; abdomen above flat, beneath a little convex; legs of moderate size and length.

The position of the antenniferous tubercles and the sulcated sternum locate this genus in the division Dymantaria.

This genus is named after M. Drégé, who more than fifty years ago presented many insects to the British Museum which he had collected at or near the Cape of Good Hope.

Dregea capensis, sp. n.

Ochraceous, thickly darkly punctate; antennæ ochraceous, apex of fourth joint black; head and pronotum with a faint central longitudinal pale line; eyes black; scutellum with the basal area more thickly and darkly punctate, the central longitudinal carination and a small spot near each basal angle pale ochraceous and levigate; corium thickly, finely, darkly punctate, somewhat less strongly punctate than on other parts of the upper surface, the veins prominent and pale ochraceous; membrane pale ochraceous, the veins darker; connexivum, body beneath, and legs ochraceous, connexivum indistinctly and irregularly finely spotted with black on extreme outer margin, a central segmental series of small spots to the abdomen beneath and the spiracles black; sternum coarsely blackly punctate with a longitudinal levigate fascia on each side beyond coxæ; apex of rostrum black; other structural characters as in generic diagnosis.

Long., ♂ ♀, 10 to 10½ mm.

Hab. Cape Town (S. African Museum).

Genus ERACTHEUS.

Eractheus, Stål, Öfv. Vet.-Ak. Förh. 1861, p. 199.

Type, *E. lutulentus*, Stål.

Eractheus rubromarginatus, sp. n.

Head, pronotum, scutellum, and corium dull obscure ochraceous, very thickly and somewhat finely darkly punctate; lateral margins of pronotum, basal area of costal margin to corium, and the connexivum sanguineous, the latter with the incisures margined with black; apex of scutellum dull ochraceous; membrane pale fuscous brown; body beneath with the lateral margins of the sternum and abdomen sanguineous, followed by a broad black submarginal fascia, which is somewhat less strongly marked on the prosternum and contains a large levigate pale ochraceous spot near the anterior and intermediate coxæ and a longitudinal segmental series of five similarly coloured spots on the abdomen, disk of abdomen brownish ochraceous, legs and rostrum pale brownish ochraceous; antennæ with the first, second, and third joints stramineous, fourth and fifth fuscous or testaceous, second, third, and fourth subequal in length or third rather shorter, fifth distinctly longest; greatest length of head equalling breadth between eyes, the lateral margins obliquely rounded; scutellum with a small black spot at each basal angle; membrane slightly passing the abdominal apex; rostrum reaching the intermediate coxæ, its apex black.

Long. 8 to 8½ mm.; exp. pronot. angl. 5 mm.

Hab. Congo Free State; Kambove (*Neave*, Brit. Mus.).

A somewhat elongate species compared with the others belonging to the genus. Allied to *E. boris*, Dall., but much narrower between the pronotal angles.

Eractheus spinosus.

Pentatoma spinosa, Sign. Rev. & Mag. Zool. 1851, p. 442.
? *Eractheus ventralis*, Bredd. Soc. Ent. xviii. p. 115 (1903).

Hab. Usambara (fide *Bredd.*); S.E. Rhodesia; Gaza Land, Chirinda Forest (*Odendaal and Swynnerton*, Brit. Mus.); W. Africa.

If I have rightly understood Breddin's description, and with a comparison of a large number of specimens received from localities on the West African Coast to Rhodesia, there is little doubt as to the above synonymy.

Genus MYROCHEA.

Myrochea, Amy. & Serv. Hist. Hém. p. 135 (1843).

Type, *M. aculeata*, Westw.

Myrochea distincta.

Myrochea distincta, Schout. Wien. ent. Zeit. xxi. p. 233 (1903).
Neodius angulatus, Dist. Ann. & Mag. Nat. Hist. (7) xii. p. 470 (1903).
Myrochea affinis, Schout. Ann. Mus. Congo Belge, Zool. iii. sect. ii. t. i. fasc. i. p. 44 (1909).

Hab, Congo, Nigeria.

Genus CAYSTRUS.

Caystrus, Stål, Öfv. Vet.-Ak. Förh. 1861, p. 199; Bergr. Mém. Soc. Ent. Belg. xv. p. 159 (1908).
Odius, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 305.
Neodius, Bergr. Rev. d'Ent. x. p. 214 (1891).

Type, *C. marginiventris*, Stål.

Caystrus nigriventris.

Cimex nigriventris, Germ. in Silb. Rev. v. p. 181 (1837).
Sciocoris nigriventris, Dall. List Hem. i. p. 134 (1851).
Caystrus marginiventris, Stål, Öfv. Vet.-Ak. Förh. 1858, p. 435.

Hab. Cape Colony (*vide* Germar and Brit. Mus.); Zanzibar (Brit. Mus.); Abyssinia (Brit. Mus.); Nyasaland (Brit. Mus.); Congo Free State (*Neave*).

In varietal specimens the black coloration of the under surface of the abdomen becomes more or less discally obliterated.

Genus ÆPTUS.

Aëptus, Dall. Cat. Hem. i. p. 145 (1851).

Æptus singularis.

Aëptus singularis, Dall. List Hem. i. p. 146, pl. iii. fig. 6 (1851).

This singularly rare species, originally collected by the Dr. A. Smith expedition in S. Africa, and of which the unique type in the British Museum has till recently been the only example, has now been supplemented by two other specimens collected at Katanga in the South-east Congo Free State by Mr. S. A. Neave, and I also possess a specimen from the Transvaal. It has also just been recorded from Kilimandjaro by Dr. Schouteden.

Genus Crollius.

Crollius, Dist. Ann. & Mag. Nat. Hist. (7) vii. p. 21 (1901).

Type, *C. conspersus*, Walk.

Crollius sudanus, sp. n.

Head, pronotum, scutellum, and corium dull ochraceous, thickly darkly punctate; scutellum with three small pale spots on basal margin and a small black spot at basal angles; membrane slaty grey, the veins piceous; body beneath black, lateral margins of sternum and abdomen, rostrum, and legs ochraceous; body elongate; antennæ ochraceous, four-jointed, basal joint stoutest, slightly passing the apex of the head, second joint slightly longer than either third or fourth, which are subequal in length, fourth joint infuscate, its apex paler; head about as long as broad between the inner margins of eyes, the lateral lobes sublaminate and reflexed, longer than the central lobe and meeting beyond it, their apices well separated, antenniferous tubercles outwardly and prominently spined; lateral margins of pronotum (very narrowly), costal margin of corium (narrowly), and the connexivum ochraceous; membrane not reaching the abdominal apex.

Long. 8 to 8½ mm.

Hab. Sudan (*A. F. Broun*, Brit. Mus.).

Allied to *C. conspersus*, Walk., but a more elongate and much narrower species; scutellum narrower, much more sinuately compressed near middle.

Genus Agabotus.

Agabotus, Dist. Proc. Zool. Soc. Lond. 1884, p. 459.

Type, *A. brunnescens*, Dist.

Agabotus ventralis, sp. n.

Head ochraceous, darkly punctate, the margins of the lateral lobes narrowly blackish; eyes black, their basal and posterior margins ochraceous; ocelli pale castaneous, situate well behind eyes and near base of head, nearer eyes than to each other; antennæ with the first joint stout, ochraceous, blackish at apex and about reaching apex of head, second and third joints black, second very slightly shorter than third (remaining joints mutilated in type); pronotum ochraceous, darkly punctate, except on the lateral ampliated margins, which are uniformly ochraceous, though sparingly punctate, these lateral margins are somewhat rounded and their anterior angles slightly but distinctly spined, a central pale longitudinal fasciate line traverses head, pronotum, and scutellum, the latter ochraceous, sparingly, coarsely, blackly punctate, more regularly and densely along the lateral margins and on each side of the central pale line, four obscure blackish punctate spots at basal margin and a levigate pale spot near each basal angle; corium brownish ochraceous, irregularly blackly punctate, the costal area paler and less punctate; membrane reaching the abdominal apex, pale purplish brown; connexivum stramineous, with a small black marginal spot at the incisures; body beneath ochraceous, thickly darkly punctate, broad lateral margin to the prosternum and broad lateral abdominal margin uniformly pale ochraceous, the latter with a marginal black spot at each incisure, on inner side of the spiracles on each side is a distinctly black longitudinal fascia, and also a central longitudinal fascia of the same colour; femora ochraceous or brownish ochraceous, tibiæ and tarsi black; rostrum ochraceous, reaching the intermediate coxæ.

Long. 11½ mm.

Hab. Congo Free State; W. of Kambove, 3500 to 4500 feet (*Neave*, Brit. Mus.).

Genus TROPICORYPHA.

Tropicorypha, Mayr, Verh. zool.-bot. Ges. Wien, 1864, p. 910; id. Reise, Novara, Hem. p. 59 (1866).

Type, *T. bifida*, Thunb.

Tropicorypha scoruba.

Pentatoma scoruba, Dall. List Hem. i. p. 243 (1851).
Halyomorpha scoruba, Leth. & Sev. Cat. Gén. Hém. i. p. 118 (1893); Kirk. Cat. Hem. (Het.) i. p. 50 (1909).

Hab. Congo (type in Brit. Mus.).

Tropicorypha capitata.

Halyomorpha capitata, Dist. Nat. in Transv. p. 249, t. iii. f. 3 (1892).

Hab. Transvaal.

Tropicorypha pretoriæ.

Halyomorpha pretoriæ, Dist. Nat. in Transv. p. 250, t. iii. f. 4 (1892).

Hab. Transvaal.

Tropicorypha rubrocincta, sp. n.

Ochraceous, above irregularly blackly punctate; body beneath and legs pale ochraceous; apical margin of head, lateral margins of pronotum, base of costal margin to corium, anterior tibiæ, apices of femora, upper surface of intermediate tibiæ and base of posterior tibiæ sanguineous; antennæ dull ochraceous, fourth and fifth joints pitchy brown, their bases dull ochraceous; a short lateral line in front of eyes on under side of head, apex of rostrum, a small spot near the anterior and intermediate coxæ, and the abdominal spiracles black; head convexly rounded in front, the apex of the central lobe only subprominent, somewhat thickly blackly wrinkled and punctate, the basal area much more sparsely punctate, a small levigate space before each eye; basal joint of antennæ not reaching apex of head, second joint larger than first, shorter than third, fourth and fifth subequal in length, moderately thickened, and each a little shorter than third; pronotum coarsely blackly punctate, more thickly and prominently so before the anterior and lateral margins, the transverse cicatrices only slightly punctate near their middle, lateral margins obliquely straight, slightly acutely reflexed, posterior angles subprominent, subacutely rounded; scutellum sparingly blackly punctate, less so centrally and basally, the basal angles with a black puncture but not spot, corium sparingly, irregularly, blackly punctate, the punctures concolorous on posterior discal area; membrane hyaline, with small rounded piceous spots; connexivum reddish ochraceous, coarsely punctate, spotted with blackish on each side of the incisures; rostrum reaching the posterior coxæ.

Long. 12½ to 13 mm.; exp. pronot. angl. 6 to 7 mm.

Hab. Natal; Durban (*Bell-Marley*, Brit. Mus.); Brit. E. Africa (*Betton*, Brit. Mus.).

Allied to *T. victorini*, Stål, differing by the practical absence of the black spot to basal angles of scutellum, different colour of antennæ, sanguineous markings, &c.

Tropicorypha maculata, sp. n.

Body above ochraceous, beneath with legs paler ochraceous; eyes, four spots (sometimes only two plainly visible) in transverse series near middle of pronotum, four small spots on basal margin of scutellum and a minute spot at its basal angles black; membrane hyaline, more or less finely spotted with brownish; head finely transversely and obliquely wrinkled, the apex somewhat broadly rounded; antennæ stramineous, apices of third and fourth joints and nearly the whole of fifth joint fuscous red, or fuscous, basal joint not reaching apex of head, second distinctly shorter than third; pronotum thickly, finely punctate, the lateral margins oblique, slightly reflexed, the lateral angles subprominent and roundly angulate; scutellum thickly finely punctate, on apical half exhibiting a more or less distinct central paler longitudinal fascia; corium thickly finely punctate; sternum distinctly punctate, a small black spot near bases of anterior and intermediate coxæ; rostrum with its apex fuscous or black and reaching the posterior coxæ; abdominal spiracles more castaneous than black.

Long. 14 to 15 mm.; exp. pronot. angl. 7 to 8 mm.

Hab. Basutoland; Maseru (*Wroughton,* Brit. Mus.); Mashonaland; Mazoe (*Marshall,* Brit. Mus.); Transvaal; Pretoria and Zoutpansberg (Coll. Dist.).

Tropicorypha fumigata, sp. n.

Above pale brownish ochraceous, thickly darkly punctate, body beneath and legs pale ochraceous; antennæ brownish ochraceous, apex of fourth joint narrowly black, first joint not reaching apex of head, second joint only slightly shorter than third, third, fourth, and fifth subequal in length, fourth and fifth more or less infuscate in different specimens; head somewhat convex in front, the lateral margins distinctly sinuate, the apex of the central lobe very slightly prominent, a small levigate space before each eye and the basal area more sparingly punctate; pronotum with the lateral margins narrowly levigate, moderately sinuate, the posterior angle shortly but distinctly prominent, their apices subacute; scutellum with the punctures more sparse on basal and central areas, the basal angles with a small pale levigate spot followed by a minute black spot on their outer margin, corium thickly darkly punctate, sometimes shaded with purplish brown on their inner area; membrane hyaline, but reflecting the dark abdomen beneath, the apex slightly passing the abdominal apex and there appearing distinctly paler; body beneath and legs pale ochraceous; a short sublateral line in front of eyes, two small spots at bases of anterior and intermediate coxæ and a single small spot at base of posterior coxæ, the abdominal spiracles and apex of rostrum black; lateral areas of the sternum coarsely punctate; abdomen beneath with a few small scattered dark spots; rostrum a little passing the posterior coxæ; connexivum ochraceous, with a linear dark spot on each side of the incisures.

Long., ♂ ♀, 11 to 14 mm.; exp. pronot. angl. 6 to 7 mm.

Hab. N.E. Rhodesia; Serenje Distr. (*Neave*); S.E. Rhodesia; Gaza Land; Chirinda Forest (*Odendaal*); South-east Congo Free State; Katanga (*Neave*, Brit. Mus.).

Allied to *T. corticini*, Germ., from which it differs by the more acute pronotal angles, different coloration, &c.

Genus Dryadocoris.

Holcostethus, Fieb. (part.) Eur. Hem. p. 333 (1861); Stål, Öfv. Vet.-Ak. Förh. 1872, no. 3, p. 37.

Dryadocoris, Kirk. Cat. Hem. (Het.) i. p. 47 (1909), *n. nom.*

Type, *H. analis*, Costa.

Dryadocoris taurus, sp. n.

Pale olivaceous green, darkly punctate; the produced pronotal angles black; apex of scutellum somewhat broadly bluish grey; connexivum, body beneath, and legs pale olivaceous green, the first with the segmental apices black; antennæ with the first and second joints pale olivaceous green, remaining joints fuscous, first joint not quite reaching apex of head, second slightly shorter than third; head somewhat thickly wrinkled and punctate; pronotum with the posterior lateral angles strongly and robustly produced and a little upwardly directed, somewhat thickly brownly punctate except on lateral margins and between the produced angles, in the latter case giving the appearance of a pale transverse fascia; scutellum coarsely punctate, especially on the anterior and lateral marginal areas, the pale apex impunctate; corium with its interior area somewhat purplish brown, thickly punctate, except at base of costal margin, which is impunctate and transversely impressed; membrane hyaline, reflecting the dark abdomen beneath, excepting where it apically projects beyond it; connexivum more or less darkly punctate; body beneath with a small black spot near bases of coxæ, a longitudinal series of dark punctures on each lateral area, and scattered black punctures on disk of abdomen; apices of tibiæ and the tarsi brownish; rostrum reaching the posterior coxæ, its apex black.

Long. 8 mm.; exp. pronot. angl. 6½ mm.

Hab. Congo Free State; Katanga; Kambove, 4000–5000 ft. (*Neave*, Brit. Mus.).

Allied to *D. gonoides*, Dall., from which it differs by the more strongly produced pronotal angles.

Genus CAURA.

Caura, Stål, Hem. Afr. i. p. 168 (1864).

Type, *C. pugillator*, Fabr.

Caura singeri, sp. n.

Head black, the whole of the central lobe, lateral and apical margins, and a spot in front and behind each eye ochraceous; antennæ black, the basal joint ochraceous; pronotum, scutellum, and corium purplish brown, lateral margins of pronotum and a spot at base of costal margin to corium ochraceous; body beneath and legs very pale ochraceous; rostrum (excluding basal joint), tibiæ (more or less), tarsi, two spots near apices of femora beneath, usually four spots on each side of the sternal segments, five series of spots to abdomen beneath, one central and two lateral, the central series arranged in groups of three, and the spiracles, black; body beneath with some scattered, irregular, sanguineous, macular markings; lateral areas of the head thickly coarsely punctate; antennæ with the second and third and the fourth and fifth joints almost subequal in length, the latter longest; pronotum, scutellum, and corium thickly finely punctate, pronotum with the lateral angles unarmed, the lateral margins distinctly moderately reflexed; membrane bronzy brown, the apex a little paler; rostrum reaching the posterior coxæ.

Long., ♂, 13 mm.

Hab. Abyssinia (*C. Singer*, Brit. Mus.).

Allied to *C. rufiventris*, Germ.; lateral margins of the pronotum more reflexed and more broadly pale-coloured; apex of scutellum more broadly and less elongately narrowed; different colour, &c.

Caura durbanensis, sp. n.

Body above ochraceous, very thickly but irregularly, blackly punctate; lateral margins of pronotum very narrowly ochraceous, and with a broken and subobsolete pale central longitudinal line; scutellum with five small ochraceous spots on basal margin; corium with a small but distinct pale spot on disk of subapical area; membrane bronzy brown, the veins darker; connexivum black, with large ochraceous segmental spots; body beneath ochraceous, thickly but irregularly blackly punctate, nearly wholly black at the lateral posterior areas of the prosternum, lateral margins of the abdomen beneath with ochraceous segmental spots; legs ochraceous, sparingly darkly punctate, apices of the intermediate and posterior femora broadly distinctly paler and almost impunctate; rostrum ochraceous, with its apex black and reaching the posterior coxæ; antennæ ochraceous, first joint with its extreme apex black, but not reaching the apex of head, second and third joints subequal in length, fifth (excluding base and apex) piceous; pronotum deflected anteriorly, the lateral angle broadly subangulate; scutellum about as long as broad at base, its apex somewhat broadly rounded.

Long. 9 mm.; exp. pronot. angl. 6 mm.

Hab. Natal; Durban (*Bell-Marley*).

"On leaves of *Suffa sphærica*, Sond."

Genus Diploxys.

Diploxys, Amy. & Serv. Hist. Hém. p. 138 (1843).

Type, *D. acanthura*, Westw.

Diploxys floweri, sp. n.

Stramineous, above sometimes slightly suffused with greyish white; head sparsely palely punctate, with the lateral margins narrowly black, the lateral lobes with their apices divergently, anteriorly, subacutely produced; antennæ with the apex of the fourth and the whole of the fifth joint (excluding base) black, second, third, and fourth joints subequal in length, fifth a little longer; pronotum coarsely, somewhat darkly punctate, a pale levigate transverse fascia between the lateral angles, which are prominent but very shortly spinously produced, and behind the angles the posterior lateral margins are narrowly black; scutellum sparingly and somewhat darkly punctate; corium sparingly, finely, and somewhat darkly punctate; membrane greyish, not passing the abdominal apex; body beneath and legs very pale ochraceous, sternum and abdomen somewhat thickly and slightly darkly punctate; abdomen with a subobsolete basal sublateral fascia on each side, an elongate spot on apical segment, the spiracles and minute marginal spots, black; femora with two small black spots beneath near apices and with a short apical spine.

Long. 12 mm.; exp. pronot. angl. 6 mm.

Hab. Blue Nile; near mouth of Dinder River (*S. S. Flower*, Brit. Mus.).

Diploxys nilotica, sp. n.

Closely allied to *D. floweri* in colour and punctuation, but with the apices of the lateral lobes of the head more outwardly divergent and more acutely conical in structure; pronotal angles much more outwardly and forwardly produced, their apices finely acute; abdomen beneath with a sublateral segmental series of spots on each side, the spiracles and small marginal spots black; antennæ with the fourth and fifth joints (excluding bases) black, third joint longer than second or fourth; femora spined at apices.

Long. 13 mm.; exp. pronot. angl. 7½ mm.

Hab. Blue Nile; near mouth of Dinder River (*S. S. Flower*, Brit. Mus.).

Diploxys rhodesiana, sp. n.

Head sparingly coarsely punctate, a levigate spot before each eye, the lateral margins and the central lobe black; antennæ testaceous, the fourth and fifth joints black, base of fourth testaceous; pronotum black, rugulose and coarsely punctate, the anterior and lateral margins, a central irregular longitudinal narrow fascia and some levigate markings on anterior area ochraceous; scutellum black, more or less rugulose and coarsely punctate, apical half paler than basal half, a yellow levigate submarginal fascia on each side for about half the length from base and a central longitudinal levigate fascia which is sometimes concolorous and sometimes ochraceous; corium black, finely punctate, the costal area more coarsely punctate, the base of costal margin ochraceous; membrane greyish, not quite reaching abdominal apex; connexivum ochraceous; body beneath and legs ochraceous, sternum and abdomen somewhat coarsely and darkly punctate, lateral margins of head, sublateral margins of sternum and abdomen and the abdominal spiracles, black; tarsi and the apices of tibiæ testaceous red; lateral lobes of head longly passing the central lobe and contiguous, their apices rounded, not acute; pronotum with the lateral margins sinuate, the lateral angles prominent and rounded but not produced; antennæ with the second, third, and fourth joints subequal in length, fifth longer.

Long. 10 to 11½ mm.

Hab. Mashonaland; Mazoe (*G. A. K. Marshall*, Brit. Mus.).

Allied to *D. rostrata*, Fabr., and *D. hastata*, Fabr., but differing from both in the rugulose and coarsely punctate pronotum and scutellum, black coloration, &c.

AMAXOSANA, gen. nov.

Head about as long as pronotum, broad at base, attenuated anteriorly, the lateral lobes meeting beyond the central lobe, their apices a little divergent and subacute; ocelli small, near base, much nearer eyes than to each other; antennæ with the first joint moderately thickened, short, scarcely reaching apical third of head, second, third, and fourth joints almost subequal in length, fifth longest; rostrum reaching the posterior coxæ; pronotum between the lateral angles about twice as broad as long, the anterior half obliquely depressed, the lateral angles prominent, broadly subacutely produced, lateral margins concavely sinuate, the anterior and posterior margins a little concave; scutellum somewhat short and broad, almost as broad at base as long, the apex broadly rounded; corium a little longer than scutellum, its apex oblique; membrane not reaching the abdominal apex, veins longitudinal, some furcate; connexivum broad, a little obliquely deflected, the segmental angles obtusely prominent; abdomen beneath moderately convex; femora distinctly thickened, tarsi robust, tarsal claws prominent.

Allied to *Diploxys*, A. & S., and *Hypaulacus*, Spin.

Amaxosana punctata, sp. n.

Ochraceous, thickly, coarsely, darkly punctate, the punctures on the head finer; antennæ ochraceous, apex of third and the whole of fourth joint testaceous red, apical joint black; posterior area of pronotum, the scutellum, and corium a little darker than the head and anterior area of pronotum; apical margin of scutellum with three small black spots, of which the two lateral ones are sometimes obliterated; membrane greyish brown; abdomen above testaceous red, connexivum ochraceous; body beneath ochraceous, thickly finely punctate; sternal lateral angles, and three irregular, more or less broken longitudinal fasciæ to sternum and abdomen, black; legs ochraceous, more or less spotted or punctured with black; structural characters as in generic diagnosis.

Long. 10 to 10½ mm.; exp. pronot. angl. 6 mm.

Hab. Portuguese E. Africa; Chibaba, Lower Buzi River (*Swynnerton*, Brit. Mus.); Transvaal.

Genus ÆLIOMORPHA.

Tetratoma, Sign. Ann. Soc. Ent. Fr. 1851, p. 339 (nom. præocc.).
Æliomorpha, Stål, Öfv. Vet.-Ak. Förh. 1858, p. 313 (n. nom.).

Type, *Æ. simulans*, Stål.

Æliomorpha gazana, sp. n.

Head, pronotum, and scutellum ochraceous; head with narrow lateral margins and a broad central longitudinal fascia widened towards base and continued over pronotum, where it is fused with a broad irregular basal margin, black; scutellum with a broad marginal fascia (extending about half its length from base and containing a short ochraceous central line) and a short elongate spot at apex, black; corium black, the costal margin narrowly ochraceous at base; membrane brownish ochraceous with fuscous veins; connexivum ochraceous, with black spots at the segmental margins; body beneath and legs pale ochraceous; lateral margins of head behind antennæ, lateral margins (broadly) of sternum, a central longitudinal fascia to abdomen beneath, and lateral marginal spots at the incisures black; antennæ ochraceous, fourth joint fuscous, first joint short, not nearly reaching apex of head, second slightly longer than third; head thickly, somewhat coarsely punctate, the lateral margins sinuate; pronotum coarsely punctate, the lateral margins almost obliquely straight; scutellum transversely wrinkled, more distinctly punctate at base and on lateral areas, a fine central longitudinal carinate line traversing both pronotum and scutellum; corium thickly coarsely punctate.

Long. 6 mm.

Hab. S.E. Rhodesia; Gaza Land, Mpudzi R. (*G. A. K. Marshall*, Brit. Mus.).

An unusually distinct species in this genus.

Genus Hermolaus.

Hermolaus, Dist. Faun. B. I., Rhynch. i. p. 169 (1902).

Type, *H. typicus*, Dist.

Hermolaus purpurissatus.

Eusarcoris purpurissatus, Reut. Öfv. Finsk. Förh. xxv. p. 6 (1882).

Hab. Ashanti; Senegal.

Hermolaus sudanensis, sp. n.

Reddish ochraceous, thickly darkly punctate; two transverse cicatrices to the anterior area, the lateral angles and posterior area of the pronotum, blackish or black; scutellum blackish, the lateral margins (excluding bases and apices) ochraceous, extreme apical margin greyish; corium pale ochraceous, sparsely palely punctate; membrane greyish, considerably extending beyond the abdominal apex; body beneath imperfectly seen in carded type, but ochraceous, darkly punctate, a broad submarginal longitudinal black fascia extending through sternum and abdomen, on sternum it is more marginal than submarginal, on prosternum contains an angulate ochraceous spot; legs ochraceous, posterior femora with a subapical black annulation; head about as long as pronotum, central lobe somewhat raised and prominent, its apex slightly projecting; antennæ with the first and second joints luteous, third and fourth piceous (fifth mutilated in type), basal joint not reaching apex of head, second longer than either third or fourth.

Long. 5 mm.; exp. pronot. angl. 3 mm.

Hab. Sudan; Kaig (*Singer*, Brit. Mus.).

Genus AGONOSCELIS.

Agonoscelis, Spin. Ess. p. 327 (1837).

Type, *A. nubila*, Fabr.

Agonoscelis odendaali, sp. n.

A narrow oblong species, breadth between pronotal angles about one-third the total length from apex of head to apex of membrane. Above reddish testaceous, thickly coarsely punctate; head with the lateral margins and the margins of the central lobe black; antennæ black, basal joint ochraceous above; pronotum with the lateral margins reflexed and ochraceous and with a black spot near the posterior angles; scutellum with the apical area very pale ochraceous; body beneath pale ochraceous; two spots on each side of pro- and mesosterna, a single spot on each side of mesosterna, the spiracles and apical joint of rostrum (excluding base) black; head with eyes about as long as broad, about as long as pronotum, coarsely somewhat brownly punctate; pronotum coarsely brownly punctate; scutellum subtransversely rugose on basal area, sometimes suffused with black on basal and lateral *but not* on apical area; corium somewhat suffused with reddish and more evenly coarsely punctate, the costal area with blackish spots or punctures; connexivum orange-yellow, with a blackish linear spot on each side of the incisures; rostrum reaching the penultimate abdominal segment; antennæ with the second joint a little shorter than the third; membrane fuliginous, with the veins darker and very prominent, considerably passing the abdominal apex.

Long. 10–10½ mm.

Hab. S.E. Rhodesia ; Gaza Land, Chirinda Forest (*David Odendaal*, Brit. Mus.).

Agonoscelis neavei, sp. n.

Above reddish testaceous; head with the lateral margins (excluding apices) and lateral margins of the central lobe from in front of eyes black; antennæ black, basal joint ochraceous above; pronotum with the lateral margins and base of lateral margins to corium somewhat broadly orange-yellow; corium suffused with purplish red; connexivum orange-yellow, transversely marked with black on each side of the incisures ; membrane pale fuliginous, the veins black; body beneath, rostrum, and legs ochraceous ; two small spots on pro- and mesosterna, a spot on metasterna, abdominal spiracles, small marginal spots at incisures, discal abdominal spots arranged in four series, apex of rostrum, two spots on apical areas of femora, apices of tibiæ, and the tarsi black ; second joint of antennæ a little shorter than third ; head (including eyes) about as broad as long and about as long as pronotum, which is coarsely thickly punctate and has the lateral margins distinctly reflexed ; corium thickly punctate, without callous spots; membrane moderately passing abdominal apex; rostrum slightly passing the base of the last abdominal segment; abdomen above reddish testaceous ; length from apex of head to apex of membrane about two and a half times the breadth at pronotal angles.

Long. 10½–11 mm.

Hab. Congo Free State, Katanga, Kambove, 4000-5000 ft. (*Neave*, Brit. Mus.).

Agonoscelis puberula.

Agonoscelis puberula, Stål, Öfv. Vet.-Ak. Förh. 1853, p. 216.

The British Museum has recently received specimens of this species from Lehututu, Bechuanaland Protectorate, and sent by Mr. R. B. Woosnam, who writes they are "a plague in the waggons : in millions."

Genus ÆTHEMENES.

Æthemenes, Stål, En. Hem. v. pp. 57 & 74 (1870).

Type, *Æ. nigropunctatus*, Sign.

Æthemenes chloris.

Pentatoma chloris, Westw. in Hope, Cat. Hem. i. p. 38 (1837).
Pentatoma (*Veterna*) *unicolor*, Stål, Hem. Afr. i. p. 158 (1864).

Pentatoma mentiens, Walk. Cat. Het. ii. p. 296 (1867).
Nezara viridula, Stål (part.), En. Hem. ii. p. 41 (1872).
Æthemenes unicolor, Stål, En. Hem. v. p. 74 (1876).
Nezara chloris, Dist. Proc. Zool. Soc. Lond. 1900, p. 813.
Nezara æthiops, Dist. Trans. Ent. Soc. Lond. 1900, p. 813.
Æthemenes chloris, Schout. Ann. Mus. Congo Belg., Zool. iii. sect. ii. t. i. fasc. i. p. 58 (1909).
Æthemenes æthiops, Schout. *loc. cit.*
Æthemenes stalianus, Kirk. Cat. Hem. (Het.) i. p. 47 (1909).

Hab. Sierra Leone (fide *Westwood*). Gambia (Brit. Mus.). Congo (Coll. Dist.). Brit. Centr. Africa; Karonga (*Andrews*, Brit. Mus.). Zanzibar (Zanquebar) (Brit. Mus.). N.E. Rhodesia; Serenje Distr. (*Neave*, Brit. Mus.). Blue Nile (*Flower*, Brit. Mus.).

This species varies in coloration from bright green, as in typical *chloris*, to purplish brown, as in typical *æthiops*.

Genus NEZARA.

Nezara, Amy. & Serv. Hist. Hém. p. 143 (1843).

Type, *N. viridula*, Linn.

Nezara rinaspus.

Rhaphigaster rinaspus, Dall. List Hem. i. p. 277 (1851).
Menida rinaspus, Bergr. Rev. d'Ent. x. p. 210 (1891).
Nezara rinaspus, Dist. Ann. & Mag. Nat. Hist. (7) v. p. 392 (1900); Schout. Ann. Mus. Congo Belge, Zool. ser. iii. t. i. fasc. i. p. 61 (1909).

The type from Sierra Leone is still alone represented in the British Museum. Dr. Schouteden has recorded it from Kilimandjaro and Meru (Sjöstedt's Exped.), and I had already seen examples from the Haut-Congo (Ann. Soc. Ent. Belg. 1901, p. 27).

Bergroth (*supra*) stated that the species "est sans doute une *Menida*," which evidently led Lethierry and Severin astray in enumerating it as a *Menida* in their Cat. Hém. (1893).

AMATEMBUNA, gen. nov.

Head about as long as breadth at base including eyes, the lateral margins sinuate, lobes about equal in length, the apices of the lateral obliquely rounded; ocelli near base and much nearer to eyes than to each other; antennæ with the basal joint not reaching apex of head, second joint shorter than third, fourth and fifth longest and subequal in length; rostrum reaching the posterior coxæ, second and third joints subequal in length; pronotum almost twice as broad at base as long, lateral margins oblique, very obscurely sinuate, extreme edge subacute and slightly reflexed, anterior angles shortly but distinctly spined, posterior angles rounded, not prominent; scutellum much longer than broad at base, the apical third attenuated, a small curved linear callosity at each basal angle; corium twice as long as its greatest breadth; membrane slightly passing abdominal apex, the veins mostly furcate; mesosternum centrally carinate, the carination in a globular depression; base of the abdomen unarmed or very slightly centrally tuberculously produced.

Allied to the Oriental genus *Critheus*, Stål, but with the rostrum shorter, membranal veins furcate, &c.

Amatembuna neavei, sp. n.

Ochraceous, thickly irregularly darkly punctate; a linear callosity at basal angles and the apex (broadly) of scutellum and a somewhat large levigate spot on apical third of corium yellowish white; membrane more or less fuliginous; connexivum ochraceous, transversely marked with black at the incisures; body beneath ochraceous; abdomen beneath with two broad longitudinal black fasciæ on disk, which meet or almost meet near apex; meso- and metasterna also more or less marked with black; legs dark ochraceous; antennæ with the first, second, and third joints ochraceous or testaceous, fourth and fifth joints more or less piceous or black; head thickly finely blackly punctate; pronotum more coarsely and sparsely punctate, with scattered, transverse, linear, callous, pale yellowish markings; scutellum coarsely sparsely blackly punctate, before apex shortly, distinctly, longitudinally impressed, the apical pale area very finely and obscurely punctate, sternum sparsely coarsely punctate, abdomen thickly and more finely punctate.

Long., ♂ 11, ♀ 12 mm.; exp. pronot. angl. 5½–6 mm.

Hab. Congo Free State; W. of Kambove, 3500–4500 ft. (*Neave*, Brit. Mus.).

Genus Euryaspis.

Euryaspis, Sign. Ann. Soc. Ent. Fr. (2) ix. p. 342 (1851).

Type, *E. transversalis*, Sign.

Euryaspis congolensis, sp. n.

Head ochraceous, the basal margin black, the lateral lobes inwardly margined with black punctures, and thus apparently enclosing two pale ochraceous spots; pronotum with the anterior area more or less ochraceous, the posterior area pale castaneous brown, the first sparsely darkly punctate, the latter more thickly punctate, a series of black punctures before the anterior margin, the cicatrices levigate and dull greyish; scutellum ochraceous, with a pale levigate spot at each basal angle and with castaneous punctures on basal area, a little behind middle a transverse posteriorly angulate castaneous fascia, the apical area punctured with castaneous; corium castaneous brown, with a large black spot a little before middle; membrane blackish; body beneath ochraceous, thickly castaneously punctate (imperfectly seen in carded typical specimen); antennæ pale castaneous brown, second joint a little shorter than third, fourth and fifth longest and subequal in length; scutellum almost impunctate on anterior disk; corium thickly finely punctate; membrane scarcely passing abdominal apex.

Long. 7½ mm.; exp. pronot. angl. 5 mm.

Hab. Congo.

Differs from both *E. signoreti*, Stål, and *E. mashonæ*, Dist., by the shorter and broader structure, the distinct punctures on the anterior area of the pronotum, the angulate fascia to the scutellum, the blackish membrane, the nonsinuate margins of the scutellum, &c.

Genus ANASIDA.

Anasida, Karsch, Berl. ent. Zeitschr. xxxvii. p. 481 (1892).

Type, *A. tenebrio*, Karsch.

Anasida funebris.

Anasida funebris, Dist. Ann. & Mag. Nat. Hist. (7) vi. p. 59 (1900).
Anasida tenebrio, Schout. (part.) Rhynch. Æthiop. i. fasc. 2, p. 191 (1905); id. in Wysm. Gen. Insect. fasc. 52, Asopinæ, p. 53 (1907).

My friend Dr. Schouteden has fallen into error with the above species. *A. funebris* is an altogether narrower and more slender species than that figured by Karsch, and both again are distinct from the figure given by Schouteden as *A. tenebrio* (*supra*, pl. iii. fig. 12), which has the apex of the scutellum narrow and pointed, and not broad and more or less truncate, as in *A. tenebrio*, Karsch, and *A. funebris*, Dist. For the species represented by Schouteden's figure I propose the name of *A.? schoutedeni*.

A. funebris I only know from Natal (Brit. Mus. and S. Afr. Mus.). *A. tenebrio* was described from W. Africa; Malange (Berlin Mus.). *A.? schoutedeni* is from the Congo.

[To be continued.]

XI.—*New Species of Diploptera in the Collection of the British Museum.* By GEOFFREY MEADE-WALDO, B.A.

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PART II.

THE present paper contains descriptions of new species of the genus *Odynerus*, Latr., from various localities, and of a new genus *Rhynchalastor* from German East Africa. This genus is of particular interest, adding as it does a third genus to Section III. of the family Eumenidæ, in which the second cubital cell of the fore wing is petiolate. Of the two known genera of this section, *Hymenosmithia*, D. T., contains but one species, *H. natalensis*, Sauss., described from Natal; the other genus, *Alastor*, Lepel., is of wide distribution, but principally confined to Australia and S. America, no known species being met with in Tropical Africa. The types are all in the National Collection.

DIPLOPTERA, Latr.

Eumenidæ, Westwood.

ODYNERUS, Latr.

Odynerus confluentus, Smith.

Odynerus confluentus, Smith, Cat. Hym. Brit. Mus. vol. v. p. 60.
Odynerus hyades, Cam. Journ. Straits Asiatic Soc. vol. lvii.

Smith described this species from Sumatra; *O. hyades*, Cam., is quite identical with Smith's type. There is a specimen from the Thaungyin Valley, Tenasserim (coll. Bingham) in the National Collection.

Odynerus (*Symmorphus*) *latipennis*, Smith.

Odynerus (*Symmorphus*) *latipennis*, Smith, Journ. Proc. Linn. Soc., Zool. ii. p. 112. no. 6 (1857).
Odynerus cilicius, Cam. Journ. Str. Asiatic Soc. vol. xxxvii. p. 11 (1901).

Both described from Sarawak, Borneo; the species described by Cameron is identical with Smith's species, with the type of which it has been compared.

Type of *O. cilicius* in B.M. Coll. Type of *O.* (*Symmorphus*) *latipennis* in the Oxford University Museum.

Odynerus (*Leionotus*) *miniatus*, Sauss.

Odynerus (*Leionotus*) *miniatus*, Sauss. Et. fam. Vesp. Suppl. p. 249 (1854).
Pterochilus pulchellus, Smith, Trans. Soc. Zool., Lond. vol. vii. (3) p. 190 (1870).

A comparison between the types of these two insects, both of which are in the British Museum, leaves no doubt that they are the same. Both were described from India.

Odynerus hottentottus, Sauss.

Odynerus hottentottus, Sauss. Ét. Fam. Vesp., Suppl. p. 244 (1856).
Odynerus erythrospilus, Cam. Record Albany Mus.

Cameron's species is described from Dunbrody in Cape Colony; Saussure's species came from the Cape of Good Hope.

Odynerus simplicipes, Cam. Trans. Amer. Ent. Soc. xxxi. p. 380.

This species, described from Mexico, is certainly not an *Odynerus*. The neuration of the fore wing is that of Saussure's Section I. (Études sur les Vesp. i. p. xxix). As there is only one specimen and the mouth-parts are not visible, it is impossible to ascertain its true position, but it bears no resemblance to the other genera of this section, of which no species appear to have been described from Central America.

I do not adopt Schulz's new name of *Odynerus vicarius* ('Spolia Hymenopterologica,' p. 219), since the insect will have to be removed from *Odynerus*.

Odynerus (*Leionotus*) *moultoni*, sp. n.

Niger, rugose punctatus; clypeo mandibulisque flavo-maculatis; antennis, pedibus, abdominis segmentorum margine postico ferrugineis; alis læte flavo-hyalinis.

♂. Black; a subtriangular mark reaching to the truncation of the clypeus, the scape beneath, a small spot at the base of the mandibles, yellow. Flagellum, legs, and apical margin of all abdominal segments dark ferruginous. Wings rich golden hyaline. Clypeus as broad as long, truncate at the apex. Pronotum truncate, produced to form a sharp angle on either side of anterior margin, and gradually widening towards the tegulæ. Scutellum and postscutellum of almost equal size, the latter broadly subtriangular, median segment concavo-truncate. Abdomen: first abdominal segment massive, broader than long, as broad as the second abdominal segment at base. Punctured: clypeus, head, and thorax coarsely cribosely, abdomen more finely. Whole covered with grey pubescence of varying density, thickest on clypeus and propleuræ, but conspicuous on mesopleuræ, disc of mesonotum, and the abdomen both dorsally and ventrally.

Length 9 mm.

Hab. Kuching (Sarawak), 1899; 1 ♂.

Dedicated to Mr. J. C. Moulton, the Curator of the Sarawak Museum.

Most nearly allied to *O. fulvipennis*, Sm., from Celebes, but can be distinguished (*a*) by the anterior margin of the pronotum being narrower than the width of the thorax at the tegulæ, whereas in *O. fulvipennis* the anterior margin of the prothorax is as wide as the thorax at the tegulæ; (*b*) by the narrower head, as the head in each species is equal in width to the prothorax; (*c*) by the absence of yellow behind the eyes, on the prothorax anteriorly, and on the terminal abdominal segments.

Odynerus (*Symmorphus*) *tukvarensis*, sp. n.

Niger, sparse punctatus; pronoti angulis anticis acutis; pronoti margine antico utrinque maculato, scutello bimaculato; abdominis segmentorum 1, 2 margine postico, tibiis tarsisque luteis; alis fusco-hyalinis.

♀. Black; an oval spot on clypeus, two minute oval spots above the insertion of the antennæ, a minute spot behind each eye, the anterior angles of the pronotum, a spot on mesopleuræ on each, two elongate marks on posterior margin of the scutellum, apical margin of first abdominal segment dorsally, apex of second abdominal segment both dorsally and ventrally, yellow. Scape beneath, the tegulæ, tibiæ, and tarsi ferrugineous. Clypeus ovate, rather broadly truncate at the apex, pronotum produced to form a sharp angle on each side of anterior margin, a deep transverse furrow divides scutellum from postscutellum, median segment with a distinct dorsal surface, concavo-truncate posteriorly; first abdominal segment as in typical *Symmorphus*, about as wide as median segment, second abdominal segment separated from first by a constriction. Punctured: clypeus shining, minutely, head and pronotum rather more coarsely, mesonotum traversed by two longitudinal furrows, sparsely punctured; median segment coarsely and cribosely punctured, first abdominal segment finely, base of second abdominal segment very coarsely punctured. Wings fusco-hyaline, rather more obscure towards costa.

Length 7 mm.

Hab. Tukvar, Sikhim (4000 ft.), Bingham Coll.; 1 ♀.

One of the few species of this subgenus from Asia, the headquarters of *Symmorphus*, Wesm., being Europe and America.

Odynerus (*Ancistrocerus*) *assamensis*, sp. n.

Niger, rugose punctatus; prothoracis margine antico, tegulis, postscutello, abdominis segmentorum 1, 2 margine postico rufo-ferruginois; clypeus niger, flavo-maculatus.

♀. Black; a spot at base and two small spots at apex of clypeus, and a small spot on vertex above insertion of the antennæ, yellow. Scape beneath, anterior margin of pronotum, tegulæ, a large ovate spot on mesopleuræ, postscutellum, apical margin of first abdominal segment dorsally, and of second abdominal segment both dorsally and ventrally, anterior and intermediate tibiæ, brick-red. Wings clear hyaline, fuscous along the costa, second cubital cell subtriangular. Clypeus convex, subtriangular; thorax in front rather wider than median segment, anterior margin of pronotum rounded, gradually widening towards the tegulæ; median segment rounded posteriorly, concavo-truncate; first abdominal segment about as wide as median segment, narrower than the second. Punctured: head and thorax coarsely and regularly, first and second abdominal segments less coarsely.

Length 8 mm.

Hab. Shillong, Assam (*R. E. Turner*), May 1903; 2 ♀, 1 ♂.

Nearly allied to *O. sikhimensis*, Bing., but can be readily distinguished from that species by the absence of any pubescence, the more uniform puncturation, the subtriangular second cubital cell, and smaller size.

It has some resemblance to *O. tytides*, Cam., from Sikhim, but that species is not an *Ancistrocerus*; from *O.* (*Ancistrocerus*) *rhipheus*, Cam., it differs in the pronotum, which has the posterior margin more widely arched than in *O. assamensis*, also the postscutellum in *O. rhipheus* is black and the wings are darker.

Odynerus (*Ancistrocerus*) *androcles*, sp. n.

Niger, punctatus; clypeo partim, pronoti margine antico, tegulis, postscutello, abdominis segmentorum 1, 2 margine postico flavis; alis hyalinis, apice fuscis.

♀. Black; base of clypeus, two minute spots at the apex, scape beneath, a minute spot in the sinus of each eye, short line behind each eye, a small spot on the vertex between the insertion of the antennæ, anterior margin of pronotum in the middle, tegulæ except the centre, postscutellum, apical margin of first abdominal segment dorsally, apical margin of second abdominal segment dorsally and ventrally, apex of anterior femora, the tibiæ and tarsi, intermediate and posterior tibiæ above and the tarsi, yellow. Centre of tegulæ ferrugineous. Clypeus subtriangular, with a small apical emargination; pronotum rounded anteriorly; the thorax broadest at the tegulæ, narrowing towards the median segment, median segment truncate, slightly depressed; first abdominal segment cup-shaped, narrower than the second. The clypeus and abdomen very finely punctured, thorax and vertex of head coarsely, mesonotum traversed by two inconspicuous longitudinal keels, no furrow between the scutellum and postscutellum. Clypeus and the area round the base of antennæ covered with a short grey pubescence.

Length 7 mm.

Hab. Shillong, Assam (*R. E. Turner*); 2 ♀.

This species has the ordinary yellow coloration, and not the brick-red usually so prevalent in the Shillong neighbourhood.

Odynerus (*Ancistrocerus*) *waltoni*, sp. n.

Niger, sparse punctatus; pronoti margine antico, abdominis segmentorum 1, 2 margine postico flavis; tegulis, tibiis tarsisque ferrugineis.

♀. Black; a minute spot at the base of each antenna, a spot behind each eye, anterior margin of the pronotum, apical margin of first and second abdominal segments, bright sulphur-yellow. Tegulæ, costal nervure, apex of femora, tibiæ, and tarsi ferrugineous. Wings clear hyaline, fuscous along the costal area, most obscure round the stigma. Head and thorax rather densely, abdomen more sparsely covered with long black hair; legs clothed with a dense, short, golden-brown pubescence. Clypeus convex, as broad as long, narrowly produced towards the apex, which is slightly emarginate; pronotum broad and angular, widening towards tegulæ; scutellum arched, not distinctly divided from mesonotum, and overhanging the postscutellum; median segment truncate, produced and arched laterally, slightly depressed medially. First abdominal segment cup-shaped, rather narrower than the second. Punctured: clypeus and abdomen shining, covered with minute puncturations; scape, head, and thorax granular and rather more coarsely punctured; apex of first abdominal segment with coarse longitudinal striations on ventral surface.

Length 10½ mm.

Hab. Gyangtse, 13,000 ft.; Khamba Jong, Sikhim, 13,000–16,000 ft., Tibet Expedition (*H. J. Walton*).

♂. Clypeus, a spot between antennæ at base, sulphur-yellow; apex of femora, tibiæ, and tarsi yellow. Each side of anterior margin of pronotum produced to form a spine.

Length 8 mm.

A number of ♀ and 6 ♂.

Odynerus (*Hypodynerus?*) *hirsutus*, sp. n.

Niger, dense pilosus; abdominis segmentorum 1, 2 margine postico pallide flavis.

♀. Black; clypeus, a minute spot on each side above it, a minute spot behind each eye, a broad band on the apical margin of segments 1 and 2 of abdomen dorsally, whitish yellow. Wings hyaline; fore wings fuscous along the costa, more faintly fuscous towards the posterior margin. Covered with long dense black hair, densest on vertex of head and thorax, more sparse on abdomen. Tibiæ and tarsi with dense golden-brown pubescence. Flagellum glabrous. Clypeus flat, truncate, narrowly produced towards the apex; head narrow when compared with thorax at tegulæ; anterior angles of pronotum obtuse; median segment truncate, slightly depressed medially; a conspicuous fold at base of second abdominal segment beneath; first abdominal segment broadly bell-shaped, as broad at apex as second abdominal segment at base. Head and thorax granular and coarsely punctured, clypeus and abdomen more finely; mesonotum with four inconspicuous longitudinal furrows of varying length; tegulæ shining, impunctate.

Length 10 mm.

Hab. Khamba Jong, Sikhim, 15,000–16,000 ft., Tibet Exped. (*H. J. Walton*).

Strongly resembles the insects of Saussure's Division *Hypodynerus*, all of which come from Chili and the western face of the Andes. The long hairy coat, the whitish-yellow markings, and the fold at the base of the second abdominal segment beneath are all characteristic of the Chilian insects; the wings and feet, however, lack the reddish coloration of *Hypodynerus*, in which division I place it with doubt.

Odynerus (*Leionotus*) *wellmani*, sp. n.

Niger, sparse punctatus; clypeo basi, pronoto, maculis post oculos, macula subalari, scutello, postscutello, metanoto utrinque, maculis rotundis, segmentis abdominis 1, 2 utrinque flavis; tegulis, pedibus, segmentis 5, 6 abdominis ferrugineis.

♀. Black; clypeus at base, large mark on face above insertion of antennæ, a large mark behind the eyes on each side, the pronotum, except a narrow space in middle of anterior margin, large transverse mark on scutellum, postscutellum, a large oval mark on hind surface of median segment, a small spot on metapleuræ on each side, conspicuous round marks on each side of abdominal segments 1 and 2, coxæ, femora, and the anterior tibiæ, on the outside, yellow.

Mandibles, apical area of clypeus, scape and segments 2, 3, 4 of antennæ, tegulæ, postorbits below, median segment laterally, marks on each side of abdominal segments 1 and 2 (joining the yellow spots), two conspicuous marks on second abdominal segment on ventral surface, apical margin of abdominal segment 4, abdominal segments 5 and 6 totally ferrugineous. Tarsi, intermediate and posterior femora ferrugineous. Abdominal segments 2 and 3, with a narrow apical margin above, whitish. Wings golden hyaline, fuscous in radial cell.

Clypeus rounded at the base, rather longer than broad, narrowly produced to form two blunt, short teeth at apex. Scutellum flat, divided from the postscutellum by a conspicuous furrow; median segment truncate, rounded laterally towards the apex. Abdomen narrow, elongate; first abdominal segment cup-shaped, rather narrower than second. Punctured, head and thorax coarsely granular, clypeus very minutely; abdomen shining, impunctate.

Length 10 mm.

Hab. Angola (*C. Wellman*), Lualaba River (*S. A. Neave*), 2500–4000 ft.; 12.5.07.

There appears to be a close resemblance between this insect and the variety of the female of *O. bellatulus*, Sauss., mentioned in Saussure's Étud. Fam. Vespid. iii. Masar. 1856, p. 243, from the Gambia.

O. wellmani may be distinguished from this variety by the second joint of the flagellum, which is considerably longer than in *O. bellatulus*, Sauss.; in addition to this, the second abscissa on the radial cell is half as long as the third, whereas the second cubital cell in *O. bellatulus* is subpetiolate.

Odynerus (*Leionotus*) *simplidentatus*, sp. n.

Ferrugineus; clypeo, pronoto abdominisque segmentis margine postico flavo-fasciatis; vertice mesonotoque nigris; unguiculis vix bidentatis.

♂. Black; clypeus, a line along the inner orbits of the eyes, the sinus of the eyes, scape of antennæ beneath, hind margin of pronotum narrowly, a transverse line on postscutellum, apical margin of first abdominal segment dorsally, and of abdominal segments 2–6 dorsally and ventrally, yellow. Intermediate and posterior coxæ totally, tibiæ and tarsi principally, yellow.

Antennæ [except segments 4–10], the mandibles, a mark behind each eye, the pronotum, the tegulæ, a spot on the mesopleuræ, a quadrate mark on the disk of the mesonotum, scutellum, median segment, abdominal segments 1 and 2, except for a black mark near apex, anterior legs, intermediate and posterior femora and tarsi partially, ferrugineous.

Wings hyaline, slightly suffused with fuscous.

Thorax broadest at the tegulæ, the scutellum rather prominent, divided from postscutellum by a transverse groove, postscutellum in the form of a ridge.

Punctured: clypeus minutely; head, thorax, and apical margin of abdominal segments 2–6 coarsely; median segment and abdomen finely punctured.

Whole covered with a grey pubescence, long on the vertex and mesopleuræ.

Length 8½ mm.

Hab. Salisbury, Mashonaland, March 1900 (*G. A. K. Marshall*); 2 ♂.

This species is peculiar on account of the extremely small development of the tooth on the tarsal claws; this tooth is placed at the extreme tip, and is only visible on the closest examination. The tooth is so shaped that the apex of the claws appears to be slightly bifurcate.

Odynerus rarotongæ, sp. n.

Niger, nitidus; abdomine impunctato; clypeo, pronoto, scutello metanotoque maculis utrinque, segmentorum abdominis 1, 2 margine postico flavis; pedibus rufis.

♀. Shining black; a mark on each side of clypeus at the base, a spot between antennæ, a minute spot behind each eye, a large rectangular mark on pronotum on each side, an ovate spot on mesopleuræ on each side, a spot on scutellum on each side, and on median segment on each side, band on apical margin of first abdominal segment above, and on apical margin of second abdominal segment both above and below, pale yellow. Tegulæ, legs, except the coxæ, ferrugineous.

Wings fusco-hyaline, darker along the costal area.

Clypeus longer than broad, truncate, narrowed towards the apex, which is somewhat depressed; pronotum transverse anteriorly, widening towards the tegulæ, hinder margin strongly arched; median segment truncate, the face of the truncation depressed, each side produced to form a blunt angle, first abdominal segment cup-shaped, narrower than second abdominal segment, which is humped, when viewed from the side. Punctured: head, pronotum, and mesonotum rather coarsely, the mesopleuræ and scutellum finely; median segment and abdomen shining and nearly smooth.

Length 10 mm.

Hab. Rarotonga (*Rev. Wyatt Gill*); 4 ♀, 1 ♂.

♂. Clypeus narrower than in female, with two small teeth at apex. Otherwise similar to female.

Length 8 mm.

Closely resembles *O. flavo-cinctus*, Smith, described from Australia, but differs in the longer clypeus and smoother, more shining abdomen.

Odynerus (*Leionotus*) *woodfordi*, sp. n.

Niger; thorace punctato, et capite et thorace flavo-variegatis, abdominis segmentis postice flavo-fasciatis; antennarum scapo pedibusque rufis.

♀. Black; mandibles at base, a mark at base of clypeus on each side, a spot between antennæ at base, the sinus and a line along the inner orbits of the eyes, an elongate-ovate mark behind the eyes, anterior margin of pronotum interrupted medially, two short longitudinal lines on disk of mesonotum, tegulæ, two round spots on scutellum, a transverse line on postscutellum, a mark on mesopleuræ on each side, a round mark on anterior face of median segment on each side, narrow band on apical margin of petiole dorsally, and on apical margin of abdominal segments 2, 3, 4, both dorsally and ventrally, but more faintly ventrally, spot at apex of anterior and intermediate femora on outside, yellow. Mandibles, scape and second joint of antennæ, apical area of clypeus, legs, a spot on tegulæ, ferrugineous.

Wings hyaline, slightly fuscous at apex and along the costa.

Clypeus almost as broad as long, narrower towards the apex, on which are two short teeth; pronotum truncate anteriorly, the sides parallel, not widening posteriorly; scutellum not divided from postscutellum by suture; median segment truncate and depressed medially, the sides slightly produced and rounded. First abdominal segment rounded anteriorly, half as broad again as long; second abdominal segment at base as broad as first abdominal segment, but slightly widening posteriorly.

Head, thorax, and legs covered with a short testaceous pubescence, longest on the rounded sides of median segment.

Head and thorax rather coarsely punctured, abdomen finely punctured.

Length 12 mm.

Hab. Solomon Islands (*C. M. Woodford*); 1 ♀.

Odynerus (*Ancistroceroides*) *batesi*, sp. n.

Ochraceus, vertice nigro-maculato; alis hyalinis, costa pallide fusca, cellula cubitali secunda triangulari.

♀. Pale ochraceous; a conspicuous mark on the vertex round the ocelli, strongly emarginate anteriorly, black. Mandibles at apex and flagellum above fuscous.

Wings clear hyaline, fuscous along the costa and in the radial cell.

Clypeus as broad as long, convex, and rounded at apex; mandibles stout, hardly dentate on the inner margin. Ocelli placed in a triangle. A conspicuous transverse ridge crosses the vertex immediately behind the ocelli. Pronotum truncate at the anterior margin, the anterior angles forming conspicuous angles; scutellum and postscutellum divided by a shallow transverse furrow; postscutellum truncate posteriorly; median segment truncate, with the truncation concave, the lateral angles bluntly angular. Abdomen elongate-ovate.; first segment broadly cup-shaped, its posterior margin as broad as the second abdominal segment.

Punctured: the mandibles and clypeus finely, head and thorax coarsely; disk of mesonotum with some longitudinal striations. Covered with a greyish-white pubescence, which is longer on the terminal segments of the abdomen.

Length 7½ mm.

Hab. Ega, Brazil (*Bates*); 2 ♀.

This species is of the same ground-colour as *Odynerus* (*Leionotus*) *chloroticus*, Spin., from Egypt.

RHYNCHALASTOR, gen. nov.

Forma *Rhynchio* similis; clypeo margine anteriore acuto; palpis labialibus 3-articulatis, palpisque maxillaribus 6-articulatis.

Head small, rather rounded in front; antennæ of moderate length, simple; flagellum stout, joints subequal in length; clypeus strongly convex, *produced to a point at apex*, the greatest breadth equal to the greatest length; mandibles of moderate length, subacute, bluntly dentate on the inner side; labial palpi stout, 3*-jointed*, joint 3 half as long as joint 2, and terminated by a conspicuous bristle; maxillary palpi 6*-jointed*, joints 1 and 2 longest, joint 3 shorter than joint 2, joint 4 longer than joints 5 and 6, joints 5 and 6 subequal. Pronotum transverse, anterior angles produced to form spines laterally; mesonotum, scutellum, and postscutellum slightly arched; median segment truncate; dorsal surface medially half as long as scutellum, longer laterally, depressed; surface of truncation traversed by a longitudinal groove. Legs: intermediate tibiæ with one spur, the claws of the tarsi bifid. Wings: radial cell widely subtriangular, three cubital cells; *second cubital cell petiolate*, receiving both recurrent nervures. Abdomen as in *Rhynchium*, first abdominal segment rather narrower than the second. ♀.

This genus strongly resembles *Alastor* in general facies, but is immediately recognized as distinct by the pointed clypeus and 3-jointed labial palpi. *Alastor* does not seem to have been recorded from Africa.

Rhynchalastor fuscipennis, sp. n.

Ferrugineus, capite mesothoraceque nigris; alis fusco-hyalinis, cellula cubitali secunda petiolata.

♀. Black; mandibles, the clypeus, cheeks, scape in front, pronotum, tegulæ, mesopleuræ partly, apical half of scutellum, postscutellum, dorsal surface and sides of median segment, the legs, dark fusco-ferrugineous. Abdomen totally ferrugineous brown.

Wings fusco-hyaline, costal area darker fuscous.

Punctured: head, thorax, median segment coarsely rugosely, clypeus finely punctured; abdomen impunctate. A narrow band on apical margin of each abdominal segment shining.

Covered with a moderately long and dense ferrugineous pile, longest on abdomen; no pile present on the clypeus or mandibles.

Length 11 mm.

Hab. German East Africa; 1 ♀.

XII.—*A new Genus of Fruit-Bats and Two new Shrews from Africa.* By OLDFIELD THOMAS.

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CASINYCTERIS, gen. nov.

External characters, including even coloration, precisely as in *Scotonycteris*. The ears larger than in *S. zenkeri*. Wings reticulated, said to be orange-coloured in the fresh state.

Skull at once distinguishable from that of *Scotonycteris* by its palate being markedly shortened posteriorly and the bony floor to the long mesopterygoid fossa completely obsolete, so that the palation is practically at the level of the back of the single molar. In *Scotonycteris* there is the usual elongated palate. Palatal edge forming a reversed **W** (**M**), the median angle in continuation with a long and high vomerine ridge. Rostrum shorter in proportion than in *Scotonycteris*, bony palate more arched mesially, zygomata more abruptly expanded, postorbital processes and general cranial ridges more strongly developed. Rami of lower jaw thickened and expanded.

Dental formula as in *Scotonycteris*.

Teeth in a general way high, pointed, shorter in section antero-posteriorly, broader transversely than in *Scotonycteris*. Canines very long, curved, flattened. Cheek-teeth, both upper and lower, with the inner cusp well developed and separate, instead of being suppressed or joined to the outer as in *Scotonycteris*; this is especially noticeable in p_3, the inner cusp being distinct, two-thirds the height of the outer, while in *Scotonycteris* the outer and inner enamel-ridges of the tooth are smoothly continuous with each other.

Type. *Casinycteris argynnis*, sp. n.

This striking bat, which adds another to the long list of new genera discovered by Mr. Bates, is remarkable for possessing a palate quite unlike that of other fruit-eating bats, and more recalling that found in some of the Microchiroptera. The astonishing resemblance of the type species to *Scotonycteris zenkeri* is also noticeable. Probably both bats bear a protective resemblance to the leaves, fresh or dry, of some local tree.

Casinycteris argynnis, sp. n.

General external appearance—at least in the dried state—precisely as in *Scotonycteris zenkeri*, except that the size is materially larger, and the ears are also larger. Fur soft and fine, the general mass of the hairs about 8 mm. in length on the back, but with other longer hairs, attaining 13–14 mm., intermixed with them. Colour above about as in *S. zenkeri*, the hairs brown at base, then greyish white, with pale russet-brown tips. Head with the brown and white markings more strongly defined than in that animal, the ground-colour a little darker, the white patches prominent, present between the eyes, at the posterior angle of the eyes, at the anterior bases of the ears, and along the upper lips. In all other respects, in colour, degree of hairiness, and the marked reticulation of the wings, *C. argynnis* is so like *S. zenkeri* as not to need detailed description.

At least this is the case so far as dried specimens are concerned, but Mr. Bates states that in the fresh state the wings, ears, eyelids, and muzzle were "bright orange colour," and some traces of yellow are still present on such parts of the type as have been protected from light. Possibly the same may be the case with *Scotonycteris*, but we have no evidence on the subject.

Dimensions of the type (the body and ear measurements taken in the flesh) :—

Forearm 60 mm.

Head and body 95; ear 20; index finger (c. u.) 44·5; third finger, metacarpus 41, first phalanx 28, second plalanx 36 ; lower leg and foot (c. u.) 40.

Skull: greatest length 28·3 ; basal length 25; zygomatic breadth 20 ; interorbital breadth 5·2; tip to tip of postorbital processes 11·7 ; brain-case, breadth 13·6; palatal length 10·6; post-palatal length 14·4 ; front of canine to back of m^1 9·2.

Hab. Bitye, Ja River, S.E. Kameruns. Alt. 2000′.

Type. Adult female. Original number 502. Collected 19th November, 1909, by Mr. G. L. Bates.

Crocidura turba provocax, subsp. n.

A short-tailed mountain form of *C. t. zaodon* *.

Colour dark, slightly darker than in true *turba*, and agreeing with that described in *zaodon*; underparts brown, without the distinct greyish wash down the middle line of the belly found in *turba*. Tail as short as in *turba*, black, the long hairs light grey.

Skull with a distinctly broader brain-case than in *turba* ; teeth slightly heavier, the large second incisor not so long horizontally.

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* Osgood, Publ. Field Mus. x. p. 21 (1910).

Dimensions of the type:—

Head and body 96 mm.; tail 51; hind foot (s. u) 15·5; ear 10·5.

Skull, condylo-incisive length 24·3; breadth of brain-case 10·2; maxillary breadth 7·5; upper tooth-row 10·4.

Hab. Aberdare Mts., British East Africa. Alt. 11,000′.

Type. Adult male. Rudd Collection. B.M. no. 10.5.3.25. Original number 595. Collected 5th February, 1910, by R. Kemp. Nine specimens.

The very short tail of this species will distinguish it from the Nairobi *C. t. zaodon*, with which it agrees in the characters used to distinguish that form from the Bangweolo *C. turba*. Ten specimens of *zaodon* average 60 mm. in tail-length, with a minimum of 56, while eight examples of *provocax* average 49·6, with a maximum of 53.

Sylvisorex somereni, sp. n.

A giant *Sylvisorex*, rivalling in proportions the largest species of *Crocidura*.

Size immensely larger than in the other species of *Sylvisorex*, all of which are quite small shrews. Fur very long, soft, and rather woolly, not crisp, ordinary hairs of back about 11–12 mm. in length; mixed with those hairs there are a considerable number of longer hairs, 15–16 mm. in length, these being most numerous on the posterior back. A small lateral gland present. General colour above uniform "smoke-grey," slightly paler anteriorly, darker posteriorly, the hairs slaty grey with dull buffy-whitish tips; under surface with the bases of the hairs darker slaty, and their tips more suffused with isabella. End of muzzle, ears, upper surface of hands and feet blackish brown. Tail shorter than head and body, without longer bristles, its short fine hairs brown above and at the end, dull whitish proximally.

Skull nearly twice as long lineally, and many times as large in bulk, as that of the next largest species of the genus, *S. lunaris*. In correlation with this great increase in size, the lambdoid crests are enormously developed and extended backwards, surpassing posteriorly on each side the level of the condyles, and continuous with a posterior extension of the lateral temporal crests, the whole masseteric area forming a sort of shield on each side of the brain-case bordered by the sharp edges of the crests; on the top of the skull, however, the muscular regions do not meet to form a median sagittal crest, as they do in large Crocidinæ. The surface of the bone of this masseteric area is strongly pitted and sculptured, a parallel to this occurring alone in *Crocidura goliath*. Paroccipital process modified into a ridge, distinct from and parallel with the main masseteric ridge outside it. Lacrymal foramen large, with expanded and overhanging lip.

Teeth as usual, the fourth unicuspid slightly smaller than the subequal second and third.

Dimensions of the type (measured in skin):—

Head and body (probably shrunk) 120 mm.; tail 68; hind foot (wet) 23; ear (wet) 13.

Skull, condylo-incisive * length 33·7; condylo-basal length 33; greatest breadth 14·2; anterior breadth across palate 10·1; palatal length 15·2; upper tooth-row 15·3; tip of i^1 to tip of p^4 8·1; lower tooth-row 14.

Hab. Kyetume, near Kampala, Uganda.

Type. Adult female. B.M. no. 10.5.21.1. Collected by Dr. R. van Someren, and presented through his brother Mr. V. G. van Someren.

This remarkable shrew is so disproportionately larger than the other members of *Sylvisorex* that it has developed skull-characters which one was at first disposed to consider as of generic value. But *Crocidura goliath* gives us in that genus so close a parallel in these characters of skull-ridges and sculpturing to what is found in *S. somereni* that the latter may safely be assigned to *Sylvisorex*, with the expectation that other intermediate species will presently turn up.

XIII.—*A new Cavernicolous Cockroach.*

By R. Shelford, M.A., F.L.S.

Subfam. *Corydiinæ.*

Alluaudella, gen. nov.

Size minute. Antennæ elongate, setaceous. Palpi long and slender. Eyes reduced. Pronotum discoidal, anteriorly not covering vertex of head. Tegmina and wings considerably exceeding apex of abdomen, identical in texture and clothed with a delicate recumbent pubescence. Tegmina with mediastinal vein short, radial vein bifurcate from base, costals entirely absent, anterior ulnar simple, posterior ulna triramose, one vena spuria between the radial and anterior ulnar veins, anal vein straight, anal field much reduced, one axillary vein. Wings with the mediastinal vein short, radial vein simple, costals entirely absent, median vein bifurcate from base, ulnar bifurcate, two venæ spuriæ, posterior part of wing reduced to a small lobe with one curved axillary vein. Legs long and very slender; femora with genicular spines; posterior tibiæ with a few minute spines on the outer aspect, biseriately arranged; posterior metatarsus much exceeding in length the following joints. No tarsal arolia.

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* To front convex surface of incisors.

Fig. 1.

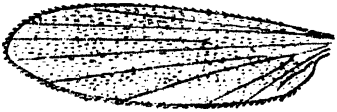

Fig. 2.

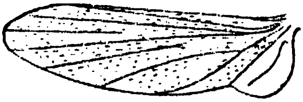

Fig. 3.

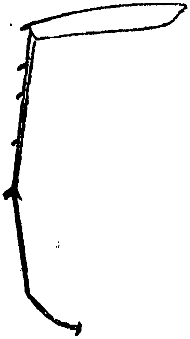

Fig. 4.

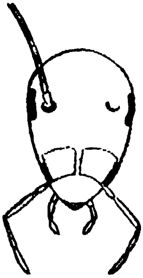

Fig. 1. Left tegmen. Fig. 2. Left wing. Fig. 3. Hind leg. Fig. 4. Head from below.

Alluaudella cavernicola, sp. n.

♂. Pale flavo-testaceous, impunctate. Frons not bullate. Eyes and antennal sockets situated low down on the frons, the former reduced to a pair of slender streaks. Supra-anal lamina trapezoidal, its apex faintly emarginate. Subgenital lamina deeply and widely cleft at the apex, the angles produced, each bearing a minute style. Posterior tibiæ longer than their femora. (Cerci mutilated.)

Length of body 3·5 mm.; length of tegmina 4·5 mm.

Kulumusi caves, near Tanga, German East Africa (*M. Ch. Alluaud*, 1909). Types in Paris and Oxford University Museums.

This remarkable genus, belonging to the *Latindia* section of the subfamily, agrees with *Cardax* mihi, from Ceylon, in the pubescent tegmina and wings, the radiate arrangement of their veins, the reduction of the posterior field of the wings.

XIV.—*Descriptions of new African Moths.*

By Sir GEORGE F. HAMPSON, Bart., F.Z.S., &c.

[Continued from vol. v. p. 496.]

Psychidæ.

PSYCHINÆ.

Manatha æthiops, sp. n.

Fore wing with veins 4, 5 from cell.

♂. Head, thorax, and abdomen blackish clothed with pale brown and whitish head; wings uniform pale brown, thinly scaled.

Hab. SIERRA LEONE (*Dudgeon*), 1 ♂; CAPE COLONY, Transkei (*Lounsbury*), 1 ♂ type. *Exp.* 20 mm.

Monda junctimacula, sp. n.

♂. Head, thorax, and abdomen white; antennæ blackish suffused with white above; fore tibiæ and first joint of tarsi black above. Fore wing semihyaline white, the apical area fuscous black-brown from costa beyond middle to termen at submedian fold, conjoined to a blackish spot above base of vein 2, and with an obscure blackish spot on it above base of vein 3. Hind wing semihyaline white.

Hab. UGANDA, Entebbe (*Minchin*), 1 ♂; BR. C. AFRICA, Likoma (*de Jersey*), 3 ♂ type. *Exp.* 22–26 mm.

Allied to *M. delicatissima*, Wlk., but the apical patch of fore wing extending on termen to vein 2 and confluent with the spots beyond lower angle of cell.

Psyche calamochroa, sp. n.

Both wings with veins 4, 5 from cell; fore wing with vein 6 present; hind wing with vein 6 absent.

♂. Uniform pale ochreous brown; antennæ with the branches slightly darker.

Hab. Br. E. Africa, Taveta (*Rogers*), 1 ♂ type. *Exp.* 20 mm.

FUMEINÆ.

Epichnopteryx transvalica, sp. n.

Fore wing with vein 9 absent; hind wing with vein 4 absent; all the veins from the cell in each wing.

♂. Uniform black-brown with a cupreous gloss, the vertex of head with a few white hairs.

Hab. Transvaal, Doornfontein (*Janse*), 1 ♂ type. *Exp.* 18 mm.

Arbelidæ.

Key to the African Genera.

A. Fore wing with vein 7 from 8 beyond 9; hind wing with veins 6, 7 from cell.	
a. Fore wing with vein 10 absent	*Lebedodes.*
b. Fore wing with vein 10 stalked with 7, 8, 9	*Paralebeda.*
c. Fore wing with vein 10 from the cell............	*Selugena.*
B. Fore wing with vein 7 from 8 before 9.	
a. Fore wing with vein 10 stalked with 7, 8, 9; hind wing with veins 6, 7 stalked	*Marshalliana.*
b. Fore wing with vein 10 from the cell; hind wing with veins 6, 7 stalked	*Arbelodes.*
c. Fore wing with veins 9 and 10 anastomosing with 8 to form the areole; hind wing with veins 6, 7 stalked	*Metarbelodes.*
d. Fore wing with vein 9 from 10 anastomosing with 8 to form the areole.	
a'. Hind wing with veins 6, 7 stalked	*Metarbela.*
b'. Hind wing with veins 6, 7 from cell	*Teragra.*

The species marked with an * are not in the British Museum.

Genus Lebedodes.

	Type.
Lebedodes, Holl. Psyche, vi. p. 534 (1893)	*cossula.*
Hollandia, Karsch, Ent. Nachr. xxii. p. 137 (1894)	*togoica.*
Hollandella, Gill, Science, xiii. p. 949 (1901)	*togoica.*
Catarbelana, B.-Baker, Ann. & Mag. Nat. Hist. (8) ii. p. 263 (1908)	*bassa.*

(1) *Lebedodes rufithorax*, sp. n.

♂. Head whitish tinged with rufous; thorax deep rufous, the outer edge of patagia whitish tinged with rufous; pectus, legs, and abdomen pale rufous, the last with the ventral surface whitish. Fore wing pale rufous, with numerous reticulate brown lines, the lines on terminal half forking towards inner margin, a dark patch on inner margin near base. Hind wing pale rufous with some dark irroration; two indistinct reticulate dark lines on terminal area.

Hab. Natal, Durban (*Casey*), 2 ♂ type. *Exp.* 34 mm.

(2) **Lebedodes togoica*, Karsch, Ent. Nachr. xxii. p. 137 (1896).

W. Africa.

(3) **Lebedodes bassa*, B.-Baker, Ann. & Mag. Nat. Hist. (8) ii. p. 263 (1908).

W. Africa.

(4) **Lebedodes endomela*, B.-Baker, Ann. & Mag. Nat. Hist. (8) iii. p. 425 (1909).

E. Africa.

(5) *Lebedodes natalica*, sp. n.

♂. Head, thorax, and abdomen red-brown, the head, tegulæ, paired metathoracic crests, and crest at base of abdomen darker; ventral surface of abdomen whitish. Fore wing red-brown; a diffused blackish fascia along median nervure bent upwards and forming a brownish blotch beyond the cell; some eight or nine irregularly waved lines, obsolete in cell, the subterminal line forming brownish blotches. Hind wing glossy grey-brown, with terminal series of slight dark spots.

Hab. Natal, Delvin (*Stanger*), 1 ♂ type. *Exp.* 36 mm.

(6) *Lebedodes cossula*, Holl. Psyche, vi. p. 534 (1893).

W. and E. Africa.

(7) *Lebedodes durbanica*, sp. n.

♂. Head and thorax black-brown; antennæ with the branches brownish ochreous; abdomen glossy seal-brown, the dorsum black-brown at base. Fore wing grey-brown, with numerous waved striated dark lines, the postmedial and subterminal lines confluent at vein 4, forming a Y-shaped mark; a wedge-shaped black patch on inner margin from near base to middle; vein 2 with fine oblique black streak. Hind wing silky grey-brown; the underside with some black striæ on costa.

Hab. NATAL, Durban (*Leigh, Bowker, Quekett*), 5 ♂ type. *Exp.* 46–50 mm.

Closely allied to *L. cossula*, Holl., but much darker and hind wing without the dark striæ.

Genus PARALEBEDA, nov.

Type *P. carnescens*.

Proboscis absent; palpi very short, porrect; antennæ of male bipectinate with moderate branches; tibiæ and tarsi fringed with long hair; abdomen with crest of rough hair at base. Fore wing with the lower angle of cell produced, vein 3 from well before angle; 4, 5 from angle or stalked; 6 from upper angle; 7, 8, 9, 10 stalked, 7 from beyond 9; 11 from cell. Hind wing with the lower angle of cell produced; veins 3 and 5 from near angle; 6, 7 from upper angle, 7 connected with 8 by an oblique bar.

SECT. I.—Fore wing with veins 4, 5 stalked.

(1) **Paralebeda schultzei*, Auriv. Ark. f. Zool. ii. p. 41 (1905). W. AFRICA.

SECT. II.—Fore wing with veins 4, 5 from cell.

(2) *Paralebeda carnescens*, sp. n.

♂. Head and thorax dark red-brown mixed with flesh-pink; abdomen flesh-pink, with slight brownish bands, the base of dorsum brown, the underside with brown mixed. Fore wing flesh-pink obscurely mottled with brown; the basal half of costa with small black spots; an antemedial diffused V-shaped black mark on inner area; a faint blackish shade beyond end of cell; a blackish subterminal shade from costa to vein 4 and a series of faint dark spots just before termen from apex to vein 2. Hind wing whitish tinged with flesh-pink, especially on basal area; some faint brown mottlings beyond lower angle of cell; the terminal half with pale brown striated mottlings, forming an indistinct postmedial line curving outwards to termen at vein 2 and a subterminal oblique line ending on termen at vein 3; cilia flesh-pink.

Hab. Natal, Durban (*Clark*), 2 ♂ type. *Exp.* 42 mm. Closely allied to *Lebedodes*? *schultzei*, Auriv.

Genus Selagena.

	Type.
Selagena, Wlk. xxxii. 590 (1865)	*transversa.*
Pettigramma, Karsch, Ent. Nachr. xxi. p. 373 (1895)	*transversa.*
Catarbela, Auriv. Ent. Tidskr. 1901, p. 127	*transversa.*

(1) *Selagena tessellata*, Dist. Ann. & Mag. Nat. Hist. (6) xx. p. 210 (1897).

S. Africa.

(2) *Selagena albonotata*, Butl. P. Z. S. 1898, p. 438.

E. Africa.

(3) *Selagena transversa*, Wlk. xxxii. 59 (1865).

Pettigramma spiculata, Karsch, Ent. Nachr. xxi. p. 374, pl. iv. fig. 5 (1895).
Catarbela strigosa, Auriv. Ent. Tidskr. 1901, p. 128.

W. Africa.

(4) *Selagena atridiscata*, sp. n.

♀. Head, thorax, and abdomen dark brown, mixed with some white and ochreous and spatulate black scales; pectus whiter. Fore wing whitish tinged with rufous and thickly tessellated with black-brown markings, leaving pale striæ between them, especially on postmedial area; an elliptical black spot in end of cell and a blackish patch below middle of cell; cilia chequered brown and whitish. Hind wing fuscous brown tinged with grey, the inner margin paler; cilia whitish, with a black line near base from apex to vein 2, the tips faintly chequered with brown; the underside with the costal and inner areas whitish.

Hab. Br. E. Africa, Taveta (*Rogers*), 1 ♀ type. *Exp.* 32 mm.

(5) *Selagena obsolescens*, sp. n.

♂. Head, thorax, and abdomen grey-white, slightly tinged in parts with rufous, the tips of patagia and dorsal crests of abdomen with some spatulate black scales; antennæ with the branches rufous. Fore wing grey-white, with obsolescent tessellated blackish markings except on costal area, more prominent and with some yellow scales on them on medial inner area; an elliptical blackish spot in end of cell; cilia chequered brown and white. Hind wing grey suffused with fuscous brown, the cilia obscurely chequered with brown from apex to vein 2; the underside whiter.

Hab. NATAL, Durban (*Clark*), 1 ♂ type. *Exp.* 40 mm.

Genus MARSHALLIANA.

	Type.
Marshalliana, Auriv. Ent. Tidskr. 1901, p. 126	*bivittata.*

(1) *Marshalliana bivittata*, Auriv. Ent. Tidskr. 1901, p. 126.

ABYSSINIA; E. AFRICA; UGANDA; GOLD COAST; S.E. CONGO; RHODESIA.

ARBELODES.

	Type.
Arbelodes, Karsch, Ent. Nachr. xxii. p. 141 (1896)	*meridialis.*
Ortharbela, Auriv. Köngl. Swedeschen Ak. Wiss. ix. p. 49 (1910)	*guttata.*

(1) *Arbelodes tetrasticta*, sp. n.

Head, thorax, and abdomen dark brown mixed with some reddish ochreous, the tips of patagia with some white hairs; the abdomen ventrally banded with ochreous. Fore wing dark reddish brown, with some ochreous on basal inner area; an indistinct ochreous spot at upper angle of cell; an oblique series of four small white spots below vein 2 between the cell and tornus. Hind wing fuscous brown; the cilia with some grey mixed.

Hab. BR. E. AFRICA, Taveta (*Rogers*), 1 ♂, 1 ♀ type. *Exp.*, ♂ 24, ♀ 26 mm.

(2) **Arbelodes guttata*, Auriv. Köngl. Swedeschen Ak. Wiss. ix. p. 50, pl. i. fig. 8 (1910).

E. AFRICA.

(3) **Arbelodes meridialis*, Karsch, Ent. Nachr. xxii. p. 141 (1896).

CAPE COLONY.

(4) *Arbelodes obliquifascia*, sp. n.

♂. Head and thorax fuscous brown mixed with grey; abdomen whitish mixed with dark brown, the basal crest blackish. Fore wing grey thickly irrorated with dark brown; a series of small blackish spots on costa; an oblique lunulate blackish fascia from just below apex to vein 5 and another from vein 5 nearer termen to inner margin; a crenulate black line just before termen. Hind wing whitish suffused with pale reddish brown.

Hab. Sierra Leone (*Mitford*), 1 ♂ type. *Exp.* 26 mm.

(5) *Arbelodes albivenata*, sp. n.

♀. Head, thorax, and abdomen brown mixed with grey-white; palpi, frons, pectus, and ventral surface of abdomen white; antennæ with the shaft white, the branches brown. Fore wing red-brown tinged with grey and slightly irrorated with blackish; a strong white streak on basal half of vein 1, the terminal half of vein 1 and the veins arising from median nervure slightly streaked with white, the costal edge whitish; three indistinct dark striæ on antemedial area from costa to median nervure; a curved series of dark points just beyond the cell from costa to vein 2, followed by a double rather oblique punctiform line; a faint dark subterminal line slightly excurved below costa and vein 6; cilia with a series of white points at base and white tips. Hind wing grey-brown, the cilia pure white at tips.

Hab. Natal, Estcourt (*Hutchinson*), 1 ♀ type. *Exp.* 30 mm.

(6) *Arbelodes rufula*, sp. n.

♂. Head, thorax, and abdomen pale rufous; palpi and lower part of frons blackish. Fore wing pale rufous; a faint brown annulus just beyond the cell; faint reticulate antemedial and two medial lines from cell to inner margin; a rather more distinct reticulate postmedial line excurved below costa and at middle and incurved between veins 7 and 5 and below vein 3; a faint subterminal shade; a terminal series of minute lunules. Hind wing whitish tinged with pale rufous.

Hab. Br. E. Africa, Takaungu (*Crawshay*), 1 ♂ type. *Exp.* 28 mm.

(7) *Arbelodes diagonalis*, sp. n.

♂. Head, tegulæ, and dorsum of thorax black-brown;

antennæ with the branches red-brown; patagia red-brown; fore legs black-brown; abdomen ochreous brown, with the extremity of anal tuft black-brown. Fore wing red-brown finely pencilled with fuscous; a very oblique black streak from below costa before middle to tornus; a slight waved blackish antemedial line from cell to inner margin; a fine medial blackish line, forming a fork from below costa to lower angle of cell, and another from lower angle of cell to inner margin; an irregularly waved blackish postmedial line incurved at discal fold; a slightly waved and somewhat diffused subterminal line and crenulate terminal line. Hind wing pale ochreous brown.

Hab. GOLD COAST, Ashanti, Obuassi (*Bergman*), 1 ♂ type. *Exp.* 34 mm.

Genus METARBELODES.

Type.

Metarbelodes, Strand, Iris, 1909, p. 119 .... *umtaliana.*

(1) *Metarbelodes obliqualinea*, B.-Baker, Ann. & Mag. Nat. Hist. (8) iii. p. 425 (1909).

E. AFRICA.

(2) *Metarbelodes umtaliana*, Auriv. Ent. Tidskr. 1901, p. 127.

RHODESIA.

Genus METARBELA.

Type.

Metarbela, Holl. Psyche, vi. p. 535 (1893)................ *stivafer.*

(1) *Metarbela arcifera*, Hmpsn. Trans. Zool. Soc. xix. p. 133, pl. iv. fig. 64 (1909).

E. AFRICA.

(2) **Metarbela pagana*, Strand, Iris, 1909, p. 118.

E. AFRICA.

(3) **Metarbela onusta*, Karsch, Ent. Nachr. xxii. p. 139 (1896).

W. AFRICA.

(4) *Metarbela triguttata*, Auriv. Ark. f. Zool. ii. p. 41, fig. (1905).

W. AFRICA; UGANDA.

(5) *Metarbela micra*, Karsch, Ent. Nachr. xxii. p. 141 (1896).
W. AFRICA.

(6) *Metarbela cymaphora*, sp. n.

Head and thorax dark glossy yellowish brown; abdomen paler yellowish brown, with the crest at base darker. Fore wing pale glossy yellowish brown with slight dark irroration; a rather quadrate blackish spot at upper angle of cell faintly defined by whitish; a slight dark line from vein 2 near its origin to inner margin, incurved and defined by whitish below vein 2; two to four obliquely placed minute white spots below vein 2 towards tornus, with a minute white spot below them on inner margin; some small alternating dark and pale spots on costa towards apex; a dark subterminal line defined on inner side by whitish striæ, excurved below costa and at middle and incurved at discal fold. Hind wing pale yellowish suffused and irrorated with brown.

Hab. RHODESIA, Bulawayo (*Marshall*), 16 ♂ type. *Exp.* 24–28 mm.

(7) *Metarbela stivafer*, Holl. Psyche, vi. p. 535 (1893).
W. AFRICA.

(8) *Metarbela dialeuca*, sp. n.

♀. Head and thorax pale red-brown mixed with white; abdomen whitish tinged with red-brown. Fore wing grey-white suffused with red-brown and slightly irrorated with dark brown; a diffused oblique whitish fascia on vein 2 from cell to tornus; two oblique dark striæ across end of cell and two divergent medial lines from submedian fold to inner margin; a diffused brownish spot just beyond the cell; a rather diffused oblique brown subterminal line. Hind wing whitish tinged with pale red-brown.

Hab. BR. E. AFRICA, Mutito-wa-Ndei (*Betton*), 1 ♀ type. *Exp.* 24 mm.

(9) *Metarbela tuckeri*, Butl. Ann. & Mag. Nat. Hist. (4) p. 400 (1875).
NATAL.

(10) **Metarbela nubifera*, B.-Baker, Ann. & Mag. Nat. Hist. (8) iii. p. 425 (1909).
E. AFRICA.

(11) *Metarbela rava*, Karsch, Ent. Nachr. xxii. p. 141 (1896).
W. AFRICA.

(12) **Metarbela fumida*, Karsch, Ent. Nachr. xxii. p. 140 (1896).
W. AFRICA.

(13) *Metarbela albitorquata*, sp. n.

♂. Head, thorax, and abdomen golden brown mixed with white, the head and tegulæ browner. Fore wing brassy yellowish thickly irrorated with red-brown; a series of black-brown spots on costa alternating with white; a white patch at base of costa and subbasal patch in submedian interspace; the base of inner margin white; a triangular white spot at middle of inner margin; a white patch from costa, on which it extends from before middle to near apex, constricted below costa, then expanding into a bilobed patch, then narrowing and forking above inner margin near tornus; a maculate white terminal band. Hind wing white; the veins beyond the cell tinged with brown; the terminal area suffused and irrorated with golden brown, broadly at costa, narrowing to a point at submedian fold; cilia chequered golden brown and white; the underside suffused with golden brown except the base, inner area, and costal edge, some slight dark spots on middle of costa.

Hab. TRANSVAAL, Pretoria (*Wilson*), 1 ♂ type. *Exp.* 30 mm.

Genus TERAGRA.

	Type.
Teragra, Wlk. v. 1064 (1855)	*conspera.*

SECT. I.—Antennæ of male with long plumose branches; hind wing with veins 6, 7 from a point.

(1) *Teragra leucostigma*, sp. n.

♂. Head, thorax, and abdomen black-brown mixed with whitish; tarsi slightly ringed with white. Fore wing whitish tinged with brown and irrorated with fuscous; slight blackish streaks below basal half of costa and in end of cell; a large elliptical white patch slightly irrorated with brown below the cell from near base to vein 2, defined below by blackish; an oblique, rather diffused, minutely dentate, blackish line from apex to above middle of inner margin, slightly excurved at vein 5; a subterminal series of small black spots from below vein 6; a terminal series of black points and striga at vein 2; cilia chequered fuscous and whitish at tips. Hind wing grey-brown, the cilia chequered fuscous and whitish at tips.

Hab. Basutoland, Machaka (*Crawshay*), 1 ♂ type. *Exp.* 40 mm.

(2) *Teragra sticticosta*, sp. n.

♂. Head, thorax, and abdomen brown mixed with some grey. Fore wing grey suffused and irrorated with brown; the costa with numerous small black spots; a black streak in lower part of cell before middle, curved downwards to vein 1 near base; a blackish antemedial bar across the submedian interspace; two black discoidal points; a quadrate brown patch, defined by whitish on inner margin before the postmedial line, which is very oblique and rather diffused on outer side from costa to vein 5 just beyond the cell, then somewhat excurved, indistinct, and defined on each side by whitish at inner margin; a brown subterminal line expanding into small spots at the veins; a terminal series of small spots; cilia with a dark brown line at middle and dark tips. Hind wing greyish suffused with brown and irrorated with dark brown; cilia with a brown line near base, the tips chequered brown and whitish.

Hab. Natal, Richmond (*Nicholson*), 1 ♂ type. *Exp.* 38 mm.

Sect. II.—Antennæ of male with moderate branches.

A. Hind wing with the discocellulars strongly angled, the upper part of cell rather short; veins 6, 7 from near together.

(3) *Teragra umbrifera*, sp. n.

♂. Head, thorax, and abdomen red-brown mixed with greyish. Fore wing greyish suffused and irrorated with red-brown; antemedial line indistinct, brownish, oblique, irregularly sinuous, from subcostal nervure to inner margin; two oblique, irregularly sinuous, medial brown lines faintly defined by whitish scales from subcostal nervure to inner margin and with a red-brown shade between them to above vein 1; postmedial line whitish, oblique and forming two slight angles from below costa to vein 7, then outwardly oblique and nearly straight, a triangular patch of red-brown suffusion beyond it to vein 2, followed by a pale band, then a slight subterminal shade formed by dark irroration; a series of minute dark lunules just before termen. Hind wing greyish suffused with brown.

Hab. Sierra Leone, Tungi (*Pearse*), 1 ♂ type. *Exp.* 46 mm.

(4) *Teragra neurosticta*, sp. n.

♂. Head, thorax, and abdomen grey-brown mixed with some blackish, the last with the crest at base blackish. Fore wing grey-brown slightly tinged with fuscous; a rounded blackish spot at upper angle of cell; two or three minute obliquely placed white spots below vein 2 towards tornus, with another minute white spot below them on inner margin. Hind wing grey suffused with brown.

Hab. Transvaal (*Pead*), 2 ♂ type. *Exp.* 20–24 mm.

(5) *Teragra simillima*, sp. n.

♂. Head and thorax pale rufous mixed with brown; pectus and legs yellow tinged with rufous, the fore tarsi brownish at extremities; abdomen yellow tinged with rufous, the basal crest with fuscous mixed. Fore wing yellow tinged with rufous, especially on costal area and in cell, and slightly irrorated with brown; antemedial line slight, double, dark, waved, from below costa to inner margin, a blackish point before it below the cell; a patch of fuscous suffusion beyond and below lower angle of cell, above an oblique whitish streak on vein 2 extending to tornus; postmedial line slight, blackish, oblique, minutely dentate, arising from costa towards apex, slightly excurved at vein 5 and angled inwards above vein 1; a fuscous subterminal shade; a series of minute blackish lunules at the extremities of the veins. Hind wing yellowish white.

Hab. Br. E. Africa, Mutito-wa-Ndei (*Betton*), 1 ♂ type, Uganda, Hoima (*Christy*), 2 ♂. *Exp.* 24–28 mm.

Almost exactly similar to *Metarbelodes obliqualinea*, B.-Baker, which is apparently distinct from *M. umtaliana*, Auriv., of which we have one female only.

B. Hind wing with the discocellulars slightly angled, the upper part of cell not short; veins 6, 7 widely separated.

(6) *Teragra guttifera*, sp. n.

♀. Head, thorax, and abdomen yellowish white mixed with rufous, the last with the ventral surface yellowish white.

Fore wing yellowish white irrorated with rufous and thickly reticulated with red-brown, forming rounded spots filled in with white, less prominent in cell and on medial part of costal area, some darker markings below and beyond end of cell. Hind wing yellowish white suffused with rufous and rather indistinctly reticulated with red-brown, forming some rounded spots filled in with white on tornal area. The underside with red-brown reticulation and forming rounded spots filled in with white on costa and terminal area of both wings.

Hab. NATAL, Durban (*Leigh*), 1 ♀ type; CAPE COLONY, 1 ♀. *Exp.* 48 mm.

(7) *Teragra conspersa*, Wlk. v. 1064 (1855).

S. AFRICA.

Cossidæ.

Phragmatœcia irrorata, sp. n.

♂. Head and thorax grey-brown with a slight ochreous tinge; abdomen pale grey-brown. Fore wing pale brownish grey thickly irrorated with fuscous. Hind wing pale brownish grey, the area beyond the cell faintly irrorated with fuscous from costa to vein 2; the underside with the costal area tinged with brown.

Hab. MASHONALAND (*Dobbie*), 2 ♂ type; NATAL, Durban (*Clark*), 1 ♂. *Exp.* 48 mm.

Allied to *P. pallens*, H.-S.

Phragmatœcia fuscifusa, sp. n.

♂. Head, thorax, and abdomen pale brownish grey. Fore wing brownish grey suffused with fuscous and slightly irrorated with whitish. Hind wing whitish faintly tinged with brown.

♀. Head and thorax dark brown, the patagia reddish brown.

Hab. SIERRA LEONE (*Dudgeon*), 1 ♂, 1 ♀ type; S. NIGERIA, Lagos, Iroko (*Dudgeon*), 2 ♂. *Exp.*, ♂ 22, ♀ 32 mm.

Allied to *P. impura*, Hmpsn., from India.

Phragmatœcia reticulata, sp. n.

♂. Head and thorax fuscous black slightly mixed with grey; abdomen grey-brown. Fore wing brown tinged and faintly reticulated with fuscous. Hind wing pale grey tinged with reddish brown, the cilia brown; the underside with the costa browner.

Hab. NATAL, Mooi R., 1 ♂ type. *Exp.* 36 mm.

Allied to *P. impura*, Hmpsn.

Phragmatœcia sericeata, sp. n.

♂. Head and thorax fuscous brown mixed with red-brown; abdomen grey-brown. Fore wing fuscous black, the terminal half except the costal area suffused with silky grey showing faint traces of dark reticulation; the terminal half of costa and inner margin with black striæ, the termen and base of cilia with small blackish spots. Hind wing pale brownish grey, the inner area towards tornus with slight dark marks; cilia faintly chequered with brown; the underside with the costa suffused with brown.

Hab. S. NIGERIA, Vivet (*Dudgeon*), 1 ♂ type. *Exp.* 30 mm.

Allied to *P. impura*, Hmpsn.

Phragmatœcia atrireta, sp. n.

♂. Head, thorax, and abdomen grey thickly irrorated with black. Fore wing grey thickly irrorated with black and closely reticulated with black lines; cilia chequered black and grey. Hind wing grey thickly irrorated with black, the terminal half faintly reticulated with dark lines; cilia faintly chequered grey and blackish; the underside with the reticulations rather more prominent.

Hab. BECHUANALAND, Lake N'gami (*Lugard*), 1 ♂ type. *Exp.* 42 mm.

Azygophleps nubilosa, sp. n.

♀. Head and thorax dark reddish brown mixed with greyish; abdomen fuscous brown, white towards base, the ventral surface whitish tinged with rufous. Fore wing pale rufous suffused with fuscous except on costal area, the dark area rather sparsely reticulated with black striæ. Hind wing white tinged with brown and rather faintly reticulated with dark brown except on basal and inner areas; cilia white chequered with black-brown from apex to submedian fold.

Hab. UGANDA (*Doggett*), 1 ♀ type. *Exp.* 82 mm.

Azygophleps flavitincta, sp. n.

♂. Head, thorax, and abdomen red-brown mixed with some ochreous white; antennæ black-brown; pectus and ventral surface of abdomen ochreous white; tarsi blackish. Fore wing pale brownish grey thickly reticulated with red-brown lines, the basal half of costa and submedian interspace tinged with reddish ochreous, the striæ on these parts blackish; a faint oblique shade from termen below apex; cilia chequered whitish and brown. Hind wing pale brownish grey, the base of inner area tinged with ochreous, the terminal half from costa to submedian fold thickly reticulated with pale brown lines; cilia chequered whitish and brown.

Hab. Br. E. Africa, Njoro (*Cholmley*), 1 ♂ type. *Exp.* 54 mm.

Azygophleps melanonephele, sp. n.

♂. Head and thorax pale yellow with paired streaks of black scales on dorsum of thorax diverging behind; palpi and frons black; antennæ fulvous yellow; abdomen yellowish white; pectus, legs, and ventral surface of abdomen towards base suffused with blackish brown. Fore wing pale yellow reticulated with orange-yellow lines; the costa with black streak from base, expanding into a triangular patch at middle, connected with a discoidal spot which is connected with a diffused oblique fascia with waved edges from termen below apex; a postmedial black patch on costa and some small spots towards apex; a slight dark shade above inner margin towards tornus; cilia with slight blackish spots at veins 4, 3. Hind wing yellowish white, with an oblique diffused fuscous brown shade from apex to beyond lower angle of cell; the underside with the costa and the shade from apex with reticulate dark markings.

Hab. S. Nigeria, Sapele (*Sampson*), 1 ♂ type. *Exp* 40 mm.

Duomitus lunifera, sp. n.

♂. Head and thorax rufous mixed with ochreous and slightly irrorated with black; palpi and lower part of frons black; patagia with black streaks on outer edge, the metathorax with paired black patches; abdomen ochreous tinged with rufous. Fore wing ochreous tinged with rufous and reticulated with red-brown; the costa with blackish striæ; a small blackish postmedial spot above vein 1; a blackish lunule from just before termen below apex to termen at vein 3; a terminal series of small blackish spots. Hind wing ochreous tinged with rufous and rather faintly reticulated with red-brown except on basal and inner areas, the costa and termen somewhat paler; a series of small brown spots on termen and cilia from apex to submedian fold.

♀. Thorax thickly irrorated with black, the dorsum of thorax and abdomen suffused with black-brown; fore wing suffused with dark brown except towards base and termen, leaving the medial part of submedian interspace paler, the reticulations dark brown; hind wing suffused with dark brown.

Hab. Sierra Leone (*Clements*), 1 ♂, 1 ♀ type *Exp.*, ♂ 76, ♀ 96 mm.

Allied to *D. moderata*, Wlk.

Duomitus polioplaga, sp. n.

♂. Head and thorax brownish grey irrorated with black, the dorsum of mesothorax black-brown; palpi, sides of frons, pectus, and legs (except the tarsi) black-brown; abdomen greyish brown irrorated with black. Fore wing brownish grey, the costal area to beyond middle and the basal area irrorated with black, the rest of wing reticulated with brown; an inverted conical grey patch on medial area from cell to inner margin, defined at sides by black and with a short black streak beyond it above vein 1; some black-brown bars from medial part of costa; the reticulations of terminal area filled in with pale grey spots varying in size; the postmedial part of costa with some dark brown spots; a short dark brown subterminal streak below apex and an irregular curved mark from below vein 8 to termen at vein 3; a terminal series of small brown spots. Hind wing grey-brown suffused with dark brown and closely reticulated with brown except on basal and inner areas, the termen somewhat greyer; a series of small dark brown spots on termen and cilia; an indistinct subterminal dark bar from below apex to vein 4, where it expands to termen as a patch.

Hab. S. Nigeria, Lagos, Olokemeji (*Dudgeon*), 1 ♂ type. *Exp.* 104 mm.

Allied to *D. moderata*, Wlk.

Duomitus biatra, sp. n.

Antennæ of male bipectinate with long branches to middle, then serrate; fore wing with vein 10 from the cell, 9 from 10 anastomosing with 8 to form the areole; hind wing with veins 6, 7 widely separated.

♂. Head, thorax, and abdomen grey tinged with red-brown and thickly irrorated with black; antennæ and legs black. Fore wing white, with numerous black striæ, the costa and inner area (except at base) and tornus tinged with rufous, the base and submedian fold to beyond middle irrorated with large black scales; an antemedial black patch on costa and rather triangular postmedial patch; some small black spots on medial part of costa and towards apex. Hind wing white, with numerous black striæ except on basal and inner areas.

Hab. Gold Coast, 1 ♂; S. Nigeria, Old Calabar (*Crompton*), 1 ♂ type. *Exp.* 54–68 mm.

Cossus ægyptiaca, sp. n.

Fore wing with veins 7, 8 shortly stalked from 9 beyond the areole; hind wing with veins 6, 7 from a point.

♂. Head and thorax dull reddish brown slightly mixed with whitish; palpi whitish, with dark patch at base and whitish tips; lower part of frons whitish; abdomen pale golden brown; pectus, legs, and ventral surface of abdomen whitish tinged with pale golden brown, the tarsi black ringed with white. Fore wing ochreous white thickly reticulated with brown, the striæ on costa, in end of cell, and at middle of inner margin black; the base of cell and inner margin without reticulations, whitish spots in base of interspaces beyond the cell, and subterminal patches without reticulations between veins 8 and 5 and 4 and 2. Hind wing white, the terminal half faintly reticulated with brown from costa to submedian fold; the underside with brown striæ from costa.

Hab. Egypt, Suez (*J. J. Walker*), 1 ♂ type. *Exp.* 46 mm.

Cossus abyssinica, sp. n.

Fore wing with veins 7, 8 shortly stalked from 9 beyond the areole; hind wing with veins 6, 7 from a point.

♂. Head, thorax, and abdomen reddish brown mixed with grey; tarsi blackish ringed with white. Fore wing grey tinged and irrorated with brown; some dark striæ on costa; traces of a curved antemedial line; two dark striæ at end of cell and a slightly sinuous line from lower angle to inner margin; two irregularly sinuous postmedial lines conjoined above inner margin; a nearly straight subterminal line, with another faint line beyond it, emitting some oblique striæ to termen above tornus. Hind wing grey-white tinged with reddish brown.

Hab. Abyssinia (*Degen*), 1 ♂ type. *Exp.* 30 mm.

Allied to *C. terebroides*, Feld.

Cossus fanti, sp. n.

Fore wing with veins 7, 8 shortly stalked from 9 beyond the areole; hind wing with veins 6, 7 from a point.

♂. Head, thorax, and abdomen dark brown mixed with grey. Fore wing greyish suffused and irrorated with red-brown; an oblique blackish subbasal line from costa to vein 1 and antemedial striga from vein 1 to inner margin; a curved slightly sinuous black medial line, with another line beyond it nearly straight to vein 2, then sinuous; the terminal area faintly striated with brown and with some black striæ from costa; two irregularly sinuous blackish lines just before termen. Hind wing greyish suffused with brown.

Hab. Gold Coast, Ashanti, Obuassi (*Bergman*), 1 ♂ type. *Exp.* 32 mm.

Allied to *C. terebroides*, Feld.

Coryphodema albifasciata, sp. n.

♂. Head and tegulæ fuscous mixed with white, the latter with diffused black band near tips; patagia white, with some fuscous hair near base; pectus, legs, and abdomen brownish grey. Fore wing grey-white irrorated with brown, some pure white below base of costa, the cell and a fascia below it pure white; an oblique brown shade from beyond lower angle of cell to submedian fold, in which there is a blackish streak on median area; the terminal area reticulated with brown lines; two more prominent lines from apical part of costa to above vein 4, where they join and then emit oblique streaks to termen at veins 4, 3, 2. Hind wing brownish white, the veins and a terminal line brown.

Hab. Cape Colony, Kokstad (*Mrs. Pringle*), 1 ♂ type. *Exp.* 32 mm.

Agrees with (*Brachionycha*) *punctulata*, Wlk., = *Coryphodema capensis*, Feld., except that veins 6, 7 of the hind wing are stalked almost to termen.

Genus TRICHOCOSSUS, nov.

Proboscis absent; palpi minute, clothed with very long hair; antennæ bipectinate with moderate branches to apex; head, thorax, and abdomen clothed with long hair, the last with the anal tuft long; tibiæ with the spurs long. Fore wing with the costa and inner margin nearly parallel, the apex rounded, the termen evenly curved; veins 1 *a* and *b* anastomosing and curved upwards beyond middle; 1 *c* slight; 2 from close to angle of cell; 3 from angle; a forked veinlet in cell; 4, 5, 6 from the discocellulars at intervals; 7, 8 strongly stalked from upper angle; 9 from angle; 10, 11 from cell. Hind wing with vein 2 from close to angle of cell; 3 from angle; 4, 5, 6 at intervals from discocellulars; 7 from upper angle; a forked veinlet in cell; 8 free.

The genus may be placed in the Tineidæ when the limits of the families are better defined.

Trichocossus albiguttata, sp. n.

♂. Head, thorax, and abdomen clothed with dark brown and white hair mixed; frons white; antennæ with the branches dark brown. Fore wing red-brown tessellated with rather ill-defined rounded white spots varying in size, with no white spots below vein 1 except two at middle, and none on terminal area except at costa; a slight darker brown discoidal spot. Hind wing red-brown, the cell and area just below it whitish.

Hab. Transvaal, Pochefstrom (*Ayres*), 1 ♂ type. *Exp.* 20 mm.

Gymnelema stygialis, sp. n.

♀. Head, thorax, and abdomen black. Fore wing black, rather sparsely irrorated with large white scales. Hind wing black-brown. Underside of fore wing with series of white spots on costa except towards base.

♂. Wings shorter and comparatively broader, especially the hind wing; fore wing with veins 9, 10 coincident, the white irroration slight, cilia pure white except at tornus; hind wing with some white in cilia towards apex.

Hab. Transvaal (*Pead*), 1 ♂, White R. (*Cooke*), 1 ♀ type, Johannesburg (*Cook*); 1 ♂; Natal, 1 ♀. *Exp.*, ♂ 18, ♀ 30 mm.

Fore wing with veins 7, 8 from the areole, 9, 10 stalked from the areole in female, coincident in male, or 7, 8 also stalked from the areole.

The genus belongs to the undefined borderland between the Cossidæ and Tineidæ; the distinction will probably be proved to be that the former has vein 1 *c* of the fore wing fully developed and reaching the termen or becoming coincident with 1 *b*, the latter slight and not reaching termen.

Gymnelema rougemonti, Heylaerts, from Delagoa Bay, the type of genus, has veins 7, 8 stalked from the areole and 9, 10 from the areole in the single female described. Heylaerts describes the larva as a case-dweller.

Gymnelema vinctus, Wlk., = *incanescens*, Butl., has veins 7, 8 from the areole and 9, 10 stalked or from the areole.

Gymnelema leucopasta, sp. n.

Fore wing with veins 7, 8 stalked from the areole, or arising from the areole, veins 9, 10 from the areole.

♂. Head, thorax, and abdomen white mixed with brown hair; tarsi blackish ringed with white. Fore wing brown mixed with white; a white patch at base irrorated with brown, almost or quite conjoined to a white costal fascia irrorated with brown and extending to near apex, some blackish spots on it on costa, its lower edge expanding into the cell at its middle and extremity; an irregular rather elongate white patch at middle of vein 1; an indistinct whitish subterminal band, incurved below vein 5 and ending at vein 2; a series of small dark spots on termen and cilia. Hind wing whitish suffused with brown except on basal and inner areas; the underside suffused with fuscous brown.

Hab. Cape Colony, Deelfontein (*Sloggett*), 3 ♂ type. *Exp.* 24 mm.

Gymnelema pelverulenta, sp. n.

Fore wing with veins 7, 8, 9, 10 from the areole.

♂. Head, thorax, and abdomen grey-white mixed with brown. Fore wing grey suffused and irrorated with brown and with numerous ill-defined small fuscous-brown spots. Hind wing grey suffused with brown, the cilia white except at base.

Hab. Transvaal, White R. (*Cooke*), 1 ♂ type. *Exp.* 24 mm.

Limacodidæ.

Hyphorma subterminalis, sp. n.

♀. Head, thorax, and abdomen red-brown slightly mixed with grey. Fore wing red-brown tinged with grey and irrorated with blackish; a small wedge-shaped black mark at middle of discocellulars; a small black mark below costa beyond middle with traces of a line from it, oblique to the discoidal mark, angled outwards beyond lower angle of cell, then oblique and angled outwards at vein 1; a strong blackish shade from costa before apex to termen above tornus, its inner edge rather diffused; a faint dark shade just before termen between veins 5 and 3. Hind wing red-brown.

Hab. Gold Coast (*Dudgeon*), 1 ♀ type. *Exp.* 30 mm.

Macroplectra obliquilinea, sp. n.

Fore wing with vein 10 from the cell; hind wing with veins 6, 7 stalked.

♂. Head, thorax, and abdomen fulvous; fore legs tinged with fuscous in front. Fore wing fulvous; an oblique white line from below costa well beyond middle to middle of inner margin, slightly excurved at lower angle of cell, defined on inner side by black between veins 6 and 2 and with some fuscous suffusion beyond it except towards inner margin. Hind wing whitish suffused with brown. Underside of both wings whitish suffused with brown and with the costa fulvous.

Hab. S. Nigeria, Olokemeji (*Dudgeon*), 1 ♂; Uganda, White Nile, Gondokoro (*Reynes-Cole*), 2 ♂, Basubika (*Betton*), 1 ♂; Br. E. Africa, Manda I. (*Jackson*), 1 ♂; Gazaland, Mt. Chirinda (*Marshall*), 1 ♂ type. *Exp.* 14–16 mm.

Macroplectra mesocyma, sp. n.

♂. Head, thorax, and abdomen pale ochreous brown. Fore wing pale ochreous brown with slight dark irroration; an oblique waved black shade slightly defined on outer side by white from upper angle of cell to middle of inner margin, interrupted at lower angle of cell; a faint oblique dark shade from costa just before apex to inner margin. Hind wing white faintly tinged with brown.

Hab. Uganda, White Nile, Gondokoro (*Reynes-Cole*), 2 ♂ type. *Exp.* 16 mm.

Macroplectra fuscifusa, sp. n.

Head, thorax, and abdomen rufous, the dorsum of thorax with black mixed; legs suffused with fuscous brown. Fore wing bright rufous sparsely irrorated with black scales; a diffused irregular black fascia in submedian fold to below end of cell; a diffused discoidal patch; an oblique waved blackish subterminal band from below costa to above tornus, its inner edge confluent with a black patch above discal fold, with traces of an oblique line from it to middle of inner margin; a terminal series of small blackish spots. Hind wing fuscous brown, the cilia whitish. Underside of both wings ochreous suffused with brown.

Ab. 1. Fore wing with the diffused blackish marking covering the greater part of inner and terminal areas and conjoined to the discoidal patch.

Hab. Gold Coast (*Dudgeon*), 3 ♂ type; S. Nigeria, Lagos, Iroko (*Dudgeon*), 4 ♂, Olokemeji (*Dudgeon*), 1 ♂; Uganda, White Nile, Gondokoro (*Reynes-Cole*), 6 ♂, 1 ♀; Br. E. Africa, Ahoos (*Betton*), 2 ♂, Shukalis (*Betton*), 1 ♂. *Exp.* 18–20 mm.

Macroplectra albescens, sp. n.

♂. Head, thorax, and abdomen pale rufous mixed with whitish, the last with indistinct whitish bands. Fore wing whitish tinged with rufous, especially on basal and costal areas, and irrorated with some fuscous; faint dark streaks below base of costa and cell; an indistinct diffused fuscous streak in end of cell; an oblique diffused fuscous line from beyond upper angle of cell to inner margin before middle, interrupted at lower angle of cell and somewhat waved towards inner margin; an oblique diffused fuscous line from costa just before apex to above inner margin, slightly incurved at discal fold; a faint subterminal fuscous shade from below apex to submedian fold; a terminal series of blackish points. Hind wing silky ochreous white; a slight brownish terminal line. Underside of fore wing suffused with brown, the costa yellow, the inner area whitish.

Hab. Br. E. Africa, Athi-ya-Mawe (*Betton*), 5 ♂ type, Machakos (*Betton*), 1 ♂, Kikuyu (*Crawshay*), 1 ♂, Kilimakin (*Crawshay*), 1 ♂. *Exp.* 20 mm.

Paraphanta biumbrata, sp. n.

♂. Head, thorax, and abdomen reddish ochreous irrorated with black; antennæ pale ochreous. Fore wing ochreous thickly irrorated with black-brown, the basal half suffused with rufous; a white medial line slightly excurved from costa to median nervure, then straight, closely followed by an oblique straight ochreous postmedial line; subterminal line rather diffused ochreous, excurved below costa and slightly incurved at middle, with lunulate patches of black suffusion before it below costa and middle; a terminal series of faint blackish spots; cilia with a fine black line near tips. Hind wing ochreous irrorated and suffused with black-brown; cilia with a faint black line near tips.

Hab. Natal, Durban (*Gooch, Leigh*), 2 ♂ type. *Exp.* 18 mm.

Allied to *P. fimbriata*, Karsch.

Zinara recurvata, sp. n.

♂. Head, thorax, and abdomen red-brown slightly mixed with grey. Fore wing reddish brown mixed with grey and with slight dark irroration, the inner half of basal area chocolate-brown; a faint straight whitish shade from costa beyond middle to vein 2, then forming a white line curved upwards to cell and inwards to inner margin before middle; a diffused incurved dark line from apex to termen at vein 4, defined on outer side by whitish. Hind wing glossy red-brown with faint grey and dark irroration.

Hab. Gold Coast, Ajinah (*Dudgeon*), 1 ♂ type. *Exp.* 22 mm.

Thosea albiviata, sp. n.

♂. Head and thorax rufous slightly mixed with whitish; abdomen rufous with faint dorsal whitish segmental lines. Fore wing rufous with rather diffused black-brown oblique line defined on each side by whitish suffusion from below apex to middle of inner margin; cilia whitish at tips. Hind wing rufous, pale yellowish towards base; cilia whitish at tips; the underside yellowish, the costal and terminal areas broadly suffused with rufous.

Hab. Cape Colony, Kowie R. (*Dr. Becker*), 2 ♂ type. *Exp.* 28 mm.

Thosea albilineata, sp. n.

Antennæ of male simple and laminate.

♂. Head, thorax, and abdomen pale rufous. Fore wing pale rufous rather sparsely irrorated with fuscous; an oblique whitish line from just below costa well beyond middle to middle of inner margin, defined on inner side by fuscous suffusion; a rather broad, slightly curved, whitish subterminal line. Hind wing pale rufous.

Hab. Mashonaland, Umtali (*Marshall*), 1 ♂ type. *Exp.* 26 mm.

Natada chrysaspis, sp. n.

♂. Head and tegulæ orange, the thorax ochreous yellow; palpi blackish at sides; antennæ with the branches fulvous; tibiæ at extremities and tarsi ringed with black; abdomen orange with fulvous dorsal bands. Fore wing silky fulvous yellow; two slight obliquely placed blackish discoidal spots; a terminal series of black points from apex to vein 2. Hind wing silky fulvous yellow with short diffused blackish streaks in the interspaces of terminal area from apex to vein 2. Underside of fore wing with the interspaces beyond the cell suffused with fuscous except towards costa and tornus; hind wing wholly fulvous yellow.

♀. Abdomen and fore wing thickly irrorated with brown and black; hind wing suffused with black-brown except inner area; the underside irrorated with brown and black except inner area of hind wing.

Ab. 1. ♂. Hind wing suffused with black-brown except the basal and inner areas and cilia.

Hab. TRANSVAAL, White R. (*Cooke*), 4 ♂ type, Piet Retief (*Crawshay*), 2 ♂; CAPE COLONY, Glen Lynden (*Mrs. Leppan*), 1 ♀. *Exp.* 26–30 mm.

Miresa coccinea, sp. n.

Antennæ of male bipectinate with short branches to apex, of female simple; hind tibiæ with two pairs of spurs.

♂. Head, thorax, and abdomen bright crimson; antennæ with the branches pale brownish. Fore wing bright crimson; a greyish-fuscous antemedial line, almost obsolete towards costa, excurved to median nervure, then oblique, connected in cell with a large medial annulate mark, incomplete above and extending from below costa to lower angle of cell, emitting streaks above vein 5 and below 2 almost to termen. Hind wing bright crimson.

Hab. S. NIGERIA, Akassa (*Lugard*), 1 ♂ type. *Exp.* 28 mm.

Miresa hæmatoessa, sp. n.

Head, thorax, and abdomen bright crimson, the patagia tinged with greyish fuscous; antennæ of male with the branches brownish. Fore wing bright crimson; greyish-fuscous streaks below costa and median nervure from base to the narrow antemedial band which is excurved to median nervure, then oblique, connected in cell with a large medial annulus extending from costa to lower angle of cell and emitting streaks above vein 5 and below vein 2 extending more or less towards termen and an oblique bar from lower angle of cell to vein 1. Hind wing bright crimson.

Ab. 1. ♀. Head, thorax, and fore wing ochreous yellow.

Hab. MASHONALAND (*Dobbie*), 1 ♂; GAZALAND, Mt. Chirinda (*Marshall*), 1 ♀; TRANSVAAL, White R. (*Cooke*), 1 ♀ type. *Exp.*, ♂ 26, ♀ 34–38 mm.

Miresa strigivena, sp. n.

♀. Head, thorax, and abdomen ochreous white. Fore wing pale ochreous; a faint white band from costa beyond middle, excurved below costa, then oblique to middle of inner margin; very slight black postmedial streaks on veins

9 to 5. Hind wing silky white; the underside with the costa tinged with ochreous.

Hab. S. NIGERIA, Lagos (*Strahan*), 1 ♀ type. *Exp.* 34 mm.

Contheyla argyrolepia, sp. n.

Fore wing with vein 10 stalked with 7, 8, 9.

♀. Head, thorax, and abdomen yellow suffused with rufous and irrorated with some black and silvery scales; palpi, pectus, legs, and ventral surface of abdomen deep rufous. Fore wing pale yellow tinged with rufous and irrorated with some black and silvery scales especially in the cilia, the costa rufous; diffused, obliquely placed, small rufous spots below bases of veins 4, 3, 2; a slight diffused curved rufous line from costa beyond middle to vein 3 near termen; a fuscous subterminal shade from costa to vein 3; a fuscous terminal line irrorated with silvery scales from apex to vein 4 followed by striæ to tornus; cilia yellow at base, black at tips, and irrorated with silver scales. Hind wing yellow tinged with rufous, the cilia with some black scales at tips.

Hab. GOLD COAST, Kumasi (*Whiteside*), 1 ♂ type. *Exp.* 26 mm.

Susica molybdea, sp. n.

Antennæ of male with short uniseriate laminate branches.

♂. Head, thorax, and abdomen yellowish tinged with rufous and glossed with silvery grey, the patagia darker at tips; palpi and fore legs browner. Fore wing red-brown strongly glossed with silvery grey, especially on medial area where the silvery suffusion has an oblique outer edge arising from costa near apex, and irrorated with a few black scales; a faint dark discoidal spot; an indistinct oblique sinuous dark line from lower angle of cell to inner margin; a faint brown subterminal line, excurved above and below middle. Hind wing pale red-brown with a greyish gloss.

Hab. SIERRA LEONE, Port Lokko (*Penny*), 1 ♂; GOLD COAST, Kumasi (*Whiteside*), 1 ♂ type. *Exp.* 38–44 mm.

Allied to *S. cinerea*, Holl.

Somara viridicosta, sp. n.

Head and thorax bright apple-green; palpi, lower part of frons, sides of head, antennæ, a dorsal fascia on thorax, outer edge of patagia, pectus, and legs deep rufous; abdomen yellow, a dorsal fascia, the extremity and ventral surface rufous. Fore wing rufous; a bright apple-green fascia on costal area to postmedial line leaving the costal edge rufous;

postmedial line deep rufous, very oblique, straight, defined on inner side by an apple-green band, expanding in and below the cell and above inner margin. Hind wing golden yellow with the terminal area rufous, broad at costa and narrowing to tornus. Underside of fore wing rufous, with some yellow below and just beyond the cell.

Hab. W. Africa (*Dudgeon*), 1 ♂ type; Uganda, Entebbe (*Minchin*), 1 ♀; Mashonaland (*Dobbie*), 1 ♂. *Exp.*, ♂ 40, ♀ 50 mm.

Somara flavicosta, sp. n.

♀. Head and thorax golden yellow, the sides of head deep rufous; antennæ chocolate-brown; legs fringed with chocolate-brown hair; abdomen golden yellow tinged with rufous at extremity. Fore wing deep rufous slightly irrorated with hairy yellow scales to the postmedial line, the terminal area paler rufous; a broad golden-yellow costal fascia to the postmedial line, on the inner side of which it forms a band extending to vein 6, then slight spots to vein 4; postmedial line deep rufous, excurved to vein 6, then oblique and slightly sinuous; cilia deep rufous. Hind wing golden yellow. Underside of both wings golden yellow.

Hab. W. Africa (*Richardson*), 1 ♀ type. *Exp.* 50 mm.

[To be continued.]

BIBLIOGRAPHICAL NOTICES.

The South African Journal of Science, being the Organ of the South African Association for the Advancement of Science. Vol. VI. No. 6. April 1910. Cape Town. Price 1s.

This number contains several short papers of considerable interest, chiefly, of course, relative to South Africa. Among them is one by Prof. E. H. L. Schwartz, on the Bearing of Recent Theories on the Nature of the Earth's Interior upon the Question of Deep Mining; but the two papers which will appeal most to the general reader are perhaps those by Rev. Father Norton, on Bushman and their Relics near Modderpoort; and on the Early Geography of South Africa, and its Bearing on Bantu Ethnography. The first paper is illustrated by two plates reproducing native drawings: one, in brown and white, appears to represent elands; and the other, in which the figures are black, repesents cattle and other animals, and a considerable number of natives in different positions. These are not very dissimilar to reproductions of Lappish drawings which we have seen.

The second paper discusses the movements of natives, as indicated by the maps of Thompson and Steedman, published in 1827 and 1835 respectively.

Catalogue of British Hymenoptera of the Family Chalcididæ. By Claude Morley, F.Z.S., F.E.S. Printed by Order of the Trustees of the British Museum. 8vo. Pp. 74.

Hitherto the British Hymenoptera, except only the Aculeata, have been greatly neglected, for though much work has been done of late years in this direction, yet it has been chiefly due to the labours of three entomologists—Marshall, Cameron, and Morley. Yet the Order is by far the largest of the seven great Orders of Insects, for the Coleoptera and Diptera are only estimated at approximately 3000 British species each, the Lepidoptera at 2000, the Hemiptera at 900, the Neuroptera at 640, and the Orthoptera at only 60; whereas the Hymenoptera, though our estimate is based on very incomplete lists, number upwards of 4830 British species.

A large proportion of these species are, however, of very small dimensions, the Mymaridæ, or Fairy Flies, belonging to the Proctotrupidæ, being the smallest insects known; some of these at least are parasitic on the eggs of other insects.

Many of the Chalcididæ, too, are very small, but they are the most numerous of the main groups of the Hymenoptera, and Mr. Morley enumerates 148 genera and 1424 species as occurring in Britain. They are almost exclusively parasitic, and, like other parasitic Hymenoptera, must do an immense work in the world by keeping down the numbers of injurious insects.

Mr. Morley's work does not profess to be a critical revision of these insects, but such a preliminary work was absolutely necessary before anything could be done to facilitate the study of this extensive and much neglected family. We regret, however, that a short bibliography should not have been added, especially as the descriptions of the principal English writer on the Family, Francis Walker, are scattered broadcast over many periodicals and separate publications: the 'Entomological Magazine,' 'Entomologist,' 'Transactions of the Entomological Society,' 'Annals and Magazine of Natural History,' 'Monographia Chalciditum,' 'List of Chalcididæ in the British Museum,' 'Notes on Chalcidiæ,' &c. This is further complicated by the circumstance that the 'Monographia Chalciditum' is not a separate work, but only a continuation, comprising the genera not previously monographed in the 'Entomological Magazine.' The difficulty of obtaining these rare works and periodicals out of London is likely long to prove a serious impediment to the effective study of this Family.

Mr. Morley's work may be regarded as a continuation of the series of Catalogues of British Insects published by the Entomological Society of London some years ago, and is uniform with them.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

April 27th, 1910.—Prof. W. W. Watts, Sc.D., M.Sc., F.R.S., President, in the Chair.

The following communications were read:—

1. 'On the Evolution of *Zaphrentis delanouei* in Lower Carboniferous Times.' By Robert George Carruthers, F.G.S.

The small simple corals that belong to the gens of *Zaphrentis delanouei* are of common occurrence in the Lower Carboniferous rocks of Scotland. Their distribution is remarkably sporadic, but it is possible to collect over wide areas of which the stratigraphy is definitely known. A large number of specimens have been got together (some twelve hundred in all), from horizons scattered throughout the sequence. The ontogeny of these specimens has been investigated by means of serial transverse sections.

The evolutionary changes observed are confined to the disposition of the septa, which has influenced the shape of the cardinal fossula in a very marked manner. The external characters, and the spacing and curvature of both septa and tabulæ, remain unchanged.

Zaphrentis delanouei is, typically, a Tournaisian species, and it has a wide fossula, expanded inwardly. When the gens first appears in the Scottish rocks (in the Cementstone Group of Liddesdale) *Z. delanouei* is the predominant form, but is associated with a mutation (in Waagen's sense) in which the fossula is parallel-sided.

In the higher limestones of Lawston Linn, another mutation appears, which, for reasons detailed in the paper, is regarded as a sport, or offshoot from the direct line of evolution.

In the succeeding Lower Limestone Group the gens undergoes further modification. Adults of the two Cementstone species are extremely rare, and the predominant form has a fossula which narrows rapidly to the inner end; in subordinate association a further mutation is also developed, in which the septa are short and amplexoid.

In the still higher horizons of the Upper Limestone Group, the last-mentioned mutation becomes predominant, and persists up to the Millstone Grit, where the septa become more amplexoid.

All these mutations, in neanic life, have characters seen in adults of the preceding form; tachygenesis is so marked that earlier ancestral traits are rarely seen.

Mutational percentages are given for many localities in the Carboniferous Limestone Series of the Central Valley, together with an analysis of the data so obtained.

Brief diagnoses of the four new species are appended to the paper, together with full locality-lists.

2. 'The Carboniferous Limestone South of the Craven Fault (Grassington-Hellifield District).' By Albert Wilmore, B.Sc., F.G.S.

As to the lithology of the beds, some are massive coarsely-stratified limestones, made up largely of crinoids, or corals, or shells (or mixtures of these); others are well-bedded, almost flaggy, black limestones made up of finely comminuted matter, with abundant foraminifera. There is every gradation between these extreme types. Variation in lithological character is lateral as well as vertical.

The strata are much disturbed everywhere. A series of folds strike roughly north-east and south-west, and are somewhat complex. There is considerable repetition of beds, and thickness is not so great as at first appears. This bears on the interesting question of the comparison of beds north and south of the Craven Fault.

The well-known knolls ('reef-knolls') are discussed. Their beds and those in the immediate neighbourhood are much disturbed. Irregular coarse bedding, folding, and normal long-continued weathering will explain most of their structural and other peculiarities. A typical knoll is dissected (Swinden); and it is seen to consist of folded, faulted, grey, coarsely-bedded limestone, with numerous great joints and much evidence of internal 'weathering.' Comparison of these knolls is drawn with the corresponding hills in the dark well-bedded limestones.

It is not easy to work out the exact zonal sequence, because of the disturbed character of the strata and the prevalence of glacial and fluvio-glacial drifts. The strata are apparently all Viséan (and the Author does not think that there is anything lower than Middle or Upper S).

In some beds, and under some circumstances, fossils are exceedingly plentiful and easily procured.

Some corals receive more especial notice, such as *Caninia gigantea*, Mich., which is distinctive of certain beds. Other species of *Caninia* are found. New or not well-known species of *Zaphrentis* are described. The Author briefly discusses the relationships of the genera *Caninia*, *Campophyllum*, *Calophyllum*, *Zaphrentis*, and *Amplexus*. New (?) species of *Lophophyllum* are also described, and the generic characters of *Lophophyllum* are discussed. There is a remarkably localized distribution of some corals, and *Syringopora* is very common in certain of the beds.

Suggestions are made as to the advisability of the disuse of some of the specific names. It is suggested that not more than four species of Carboniferous *Syringopora* need be retained.

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 32. AUGUST 1910.

XV.—*Descriptions of new African Moths.*
By Sir GEORGE F. HAMPSON, Bart., F.Z.S., &c.

[Concluded from p. 141.]

Somara albicosta, sp. n.

♂. Head deep chocolate-brown, with a whitish patch on vertex; thorax chestnut-brown, the shoulders white; abdomen yellow suffused with rufous; pectus, legs, and ventral surface of abdomen chocolate-brown. Fore wing chestnut-brown to postmedial line, the costal area pure white to beyond middle, diffused into cell and leaving the costal edge brown, the terminal area whitish suffused and irrorated with rufous; the postmedial line defining the dark area, slightly incurved below vein 6. Hind wing yellow suffused with rufous, especially on the costal area, veins, and cilia.

♀. Fore wing with the postmedial line straight and oblique.

Ab. 1. Thorax and fore wing much brighter rufous.—Kilima'njaro.

Hab. BR. E. AFRICA, Kilima'njaro (*Hannington*), 1 ♂; MASHONALAND, Salisbury (*Marshall*), 1 ♀; NATAL, Durban (*Quekett*, *Leigh*), 4 ♂, 1 ♀ type. *Exp.* 46 mm.

Allied to *S. canescens*, Wlk., which has no yellow on the hind wings.

Somara albilinea, sp. n.

♂. Head chocolate-brown; antennæ black-brown; thorax and abdomen bright rufous with a silky gloss; pectus, legs, and ventral surface of abdomen chocolate-brown. Fore wing whitish thickly irrorated and suffused with bright rufous, the costal half somewhat whiter to postmedial line, which is white, oblique, and slightly incurved. Hind wing rufous.

Hab. Ashanti, Obuassi (*Bergman*), 1 ♂ type. *Exp.* 42 mm.

Allied to *S. canescens*, Wlk., which has the postmedial line of fore wing not incurved.

Parasa mesochloris, sp. n.

♂. Head and thorax bright apple-green, rufous at sides; palpi, frons, antennæ, pectus, and legs deep rufous, some yellow below base of wings; abdomen yellow, dorsally suffused with rufous except at base, where there is a patch of green, the ventral surface deep rufous. Fore wing deep rufous; a bright apple-green medial band edged by dark rufous lines, rounded above and not quite touching costa, its inner edge oblique, its outer edge excurved to vein 6, then incurved, and again excurved below vein 3. Hind wing pale yellow, the terminal area tinged with rufous, the cilia rufous; the underside with the costa and terminal area suffused with rufous.

Hab. Gold Coast (*Hales*), 1 ♂, Kumasi (*Whiteside*), 1 ♂ type. *Exp.* 32 mm.

Nearest to *P. infuscata*, Wichgr.

Parasa microbasis, sp. n.

♂. Head and thorax bright apple-green, the palpi, lower part of frons, pectus, and legs bright rufous; abdomen yellow slightly tinged with rufous. Fore wing bright apple-green; a small tuft of yellowish-rufous hair at base of cell connected with an elliptical subbasal spot just below the cell defined by black; a terminal yellowish-rufous band, its inner edge defined by a deep rufous line, incurved below costa and strongly at middle, the termen with some darker suffusion except towards tornus. Hind wing pale yellow with a faint rufous tinge. Underside of both wings yellow tinged with rufous, the costal areas rufous.

Hab. N. Nigeria, Pangema (*Anderson*), 1 ♂ type. *Exp.* 56 mm.

Cœnobasis postflavida, sp. n.

Head and thorax blue-green; palpi orange, black at sides towards base; lower part of frons, antennæ, and tips of patagia orange; pectus, legs, and abdomen orange-yellow, the fore tibiæ banded green and black, the tarsi black at extremities. Fore wing blue-green, the costal edge orange-yellow; cilia with series of small black spots at base and yellowish tips. Hind wing pale yellow, the termen very slightly tinged with green; cilia with series of small black spots.

Hab. Sudan, White Nile (*Dunn*), 1 ♂; Br. E. Africa, Kanisa (*Betton*), 1 ♀ type. *Exp.*, ♂ 24, ♀ 28 mm.

Near *C. argentea*, Auriv., which has the hind wing pale green.

Monema leucosticta, sp. n.

Antennæ of male bipectinate with moderate branches to apex.

♂. Head, thorax, and abdomen very dark red-brown with a blackish gloss. Fore wing deep rufous glossed with grey and blackish and slightly irrorated with silvery scales, the costa and veins more rufous; a white discoidal point defined by black; a faint obliquely curved rufous line from apex to inner margin beyond middle. Hind wing pale rufous.

Hab. Gold Coast, Ashanti, Obuassi (*Bergman*), 1 ♂ type. *Exp.* 28 mm.

Apluda schaliphlebia, sp. n.

♀. Head and thorax pure white; palpi, frons, antennæ, and sides of thorax chocolate brown; pectus, legs, and abdomen yellow tinged with red-brown, the last white above at base. Fore wing silvery white; a chocolate-brown fascia on costa from base to end of cell, where it is bent downwards and emits slight streaks on veins 7, 8 to termen; a fascia on basal half of vein 1, at middle of which it is bent upwards to lower angle of cell, where it is connected by a discoidal bar with the costal fascia and by slight streaks on veins 4, 5, with an oblique band from termen below apex to inner margin beyond middle; the costal edge towards apex and a terminal line chocolate-brown.

Hab. Uganda, Toro (*Christy*), 1 ♀ type. *Exp.* 32 mm.

Near *A. invitabilis*, Wllgrn.

Apluda syngrapha, sp. n.

♂. Head and thorax white, the antennæ and thorax at sides and behind fulvous orange; palpi and frons yellow, the former with some black at sides; pectus and legs yellow, the tibiæ fringed with some spatulate black scales; abdomen golden yellow, white towards base. Fore wing white; the costa yellow to beyond middle, then the costal edge red-brown; a red-brown streak on inner margin to the postmedial line; a narrow red-brown band from upper angle of cell, slightly incurved below the lower angle and connected at upper angle by an oblique streak and at lower angle by a short streak with the postmedial band which arises near apex, is excurved below costa, then incurved; a subterminal red-brown band between veins 5 and 2. Hind wing white.

Hab. Gold Coast, Kumasi (*Whiteside*), 1 ♂ type. *Exp.* 24 mm.

Near *A. similis*, Dist.

Apluda monogramma, sp. n.

♂. Head and thorax white; frons and antennæ yellow; palpi, pectus, and legs yellow mixed with red-brown; abdomen yellow dorsally, white towards base. Fore wing silvery white; a few red-brown scales above vein 1 before middle; a postmedial rather maculate red-brown bar from vein 3 to inner margin; a small red-brown spot on costa before apex. Hind wing silvery white. Underside of fore wing with the costa suffused with red-brown.

Hab. Br. E. Africa, Kibauni (*Crawshay*), 1 ♂ type. *Exp.* 24 mm.

Altha rubrifusalis, sp. n.

♂. Head and thorax fulvous red irrorated with silvery scales; the mid tarsi at tips and the hind legs pale yellow, the latter with the tibiæ tinged with fulvous; abdomen pale yellow, dorsally tinged with fulvous except towards extremity. Fore wing with the basal half fulvous red, the base and costa strongly irrorated with silvery scales and some silver scales in end of cell; a deeper fulvous discoidal bar; the terminal half pale yellow, with curved postmedial series of black-brown points interrupted between veins 3 and 2. Hind wing pale yellow, the basal area tinged with pale fulvous red.

Hab. Sierra Leone (*Bartlett*), 1 ♂; Gold Coast (*Hales*), 1 ♂; S. Nigeria, Asaba (*Crosse*), 1 ♂ type. *Exp.* 28 mm.

Near *A. ansorgei*, B.-Baker.

Gavara camptogramma, sp. n.

♂. Head, thorax, and abdomen white slightly tinged with ochreous and mixed with brown; palpi brownish; fore legs brownish, the tarsi slightly ringed with white. Fore wing white suffused and irrorated with brown; a small blackish spot in middle of cell and rather diffused line from cell to inner margin, slightly defined on outer side by whitish; a black point at lower angle of cell; postmedial line white defined on inner side by brown suffusion, excurved at vein 6 and to termen at veins 3, 2, then retracted and oblique to inner margin; a fine dark terminal line from apex to vein 3. Hind wing silky white slightly irrorated with brown; the underside with brown terminal line.

Hab. Br. E. Africa, Machakos (*Crawshay*), 1 ♂ type. *Exp.* 20 mm.

Near *G. velutina*, Wlk.

Zygænidæ.

Staphylinochrous melanoleuca, sp. n.

♂. Head and thorax red-brown; antennæ black-brown; abdomen blackish brown; pectus, legs, and ventral surface of abdomen brownish ochreous. Fore wing with the base, costal area, and terminal half black-brown, the rest of wing semihyaline white, the outer edge of the white area oblique and bent outwards at median nervure. Hind wing semihyaline ochreous white.

Hab. Uganda, Entebbe (*Minchin*), 1 ♂ type. *Exp.* 34 mm.

Ægeriadæ.

Melittia chalconota, sp. n.

♀. Head glossy grey-brown; antennæ black; palpi white and black; thorax golden brown; pectus and fore and mid legs white and black, the hind legs black, with tufts of white and rufous hair; abdomen black, with yellowish-white segmental lines, the ventral surface white with some fuscous. Fore wing black-brown irrorated with reddish-yellow scales and with white scales on terminal area; a hyaline streak below the cell, a wedge-shaped patch in the cell bifid at extremity, and a small patch beyond the cell formed by three or four short streaks in the interspaces. Hind wing hyaline, the veins and margins narrowly black, the lobe on inner margin black suffused with grey hairs, the cilia brown.

Hab. Gold Coast, Ashanti, Obuassi (*Bergman*, *Graham*), 2 ♀; S. Nigeria, Lagos (*Graham*), 1 ♀ type. *Exp.* 26–36 mm.

Melittia rufodorsa, sp. n.

♂. Head brown mixed with whitish; palpi white; antennæ black, the club reddish below; thorax red-brown, the shoulders fuscous; legs clothed with tufts of black-brown, rufous, and white hair; abdomen black-brown with yellowish-white segmental lines, the ventral surface white. Fore wing black-brown irrorated with golden-yellow scales, especially on terminal area; a hyaline yellow streak below the cell, wedge-shaped patch in the cell, slightly bifid at extremity, and large patch beyond the cell formed by five streaks in the interspace, the streak above base of veins 6, 7 short. Hind wing hyaline yellow, the veins and margins narrowly black-brown, the lobe on inner margin black-brown irrorated with yellow, the cilia brown.

Hab. Cape Colony, 1 ♂ type. *Exp.* 32 mm.

Tinthia vitrifasciata, sp. n.

♀. Head, thorax, and abdomen dark brown mixed with some white and red-brown, the last with more or less diffused yellowish-white dorsal bands except towards base; palpi white except at tips; frons white at sides; throat white; coxæ and femora mostly white, the tibiæ and tarsi with tufts of rufous and black hair, the tarsi banded with white; ventral surface of abdomen white except at extremity. Fore wing reddish and fuscous brown irrorated with white, especially in end of cell and on terminal area; a large black annulus beyond the discocellulars, more or less incomplete above and below and filled in with rufous; a diffused black subterminal line. Hind wing black-brown slightly irrorated with white, the cell and the interspaces below it to near termen hyaline.

Hab. Mashonaland, Umtali (*Marshall*), 3 ♀ type. *Exp.* 20–24 mm.

Tinthia xanthophora, sp. n.

Hind wing with vein 3 separate from both 2 and 4, 6 from well below upper angle of cell.

♂. Head, thorax, and abdomen black; neck with white ring; abdomen with more or less white on dorsum of medial segments and on anal tuft above; palpi white in front and behind; frons white at sides; throat and fore coxæ white; tibiæ and tarsi banded with white; ventral surface of abdomen with medial white band. Fore wing black; diffused yellow streaks below base of costa and cell; a wedge-shaped patch in end of cell and patch beyond the cell, leaving a round black discoidal spot between them. Hind wing hyaline, the veins and margins black-brown; an oblique black bar on upper discocellular.

Hab. NATAL, Malvern (*Barker*), 1 ♂ type, Estcourt (*Hutchinson*), 1 ♂; CAPE COLONY, Grahamstown (*Miss M. Daly*), 1 ♂. *Exp.* 18 mm.

Tinthia endopyra, sp. n.

♀. Head, thorax, and abdomen blue-black; palpi with some scarlet at base and towards extremity; vertex of head with some scarlet hairs; dorsum of thorax and upper edge of patagia with slight scarlet streaks; fore coxæ scarlet at sides, the mid and hind tibiæ banded with scarlet; abdomen with slight scarlet patch at base of dorsum, the anal tuft with whitish and scarlet streak, the ventral surface banded with scarlet. Fore wing dark cupreous brown; a scarlet fascia above inner margin from near base to below end of cell; a round scarlet discoidal spot. Hind wing hyaline, the veins and margins cupreous brown.

Hab. NATAL, 1 ♀ type. *Exp.* 18 mm.

Lepidopoda albifrons, sp. n.

♂. Head, thorax, and abdomen black, with a metallic-blue gloss, the last with white line on fifth segment; palpi white in front except third joint; frons white; fore coxæ white; mid tibiæ with broad white band, the hind tibiæ with large tuft of blue-black hair with white spot on it, the tarsi whitish below ringed with black; abdomen white ventrally, with some black at base of first two segments. Fore wing black, with a metallic-blue gloss; a slight hyaline streak below base of cell; a wedge-shaped hyaline patch in end of cell; the interspaces beyond the cell with hyaline streaks; the inner edge of the broad terminal band minutely dentate in the interspaces. Hind wing hyaline, the veins and margins black; a black bar on upper discocellular; the inner area black, with a silvery-blue gloss; the hair at base of inner margin white; the terminal band narrow, with very slightly waved inner edge; cilia brownish.

♀. Mid and hind legs much less strongly tufted with hair and with white bands at middle and extremity; abdomen with some white on anal tuft above, the ventral surface brownish; wings hyaline, the veins and margins narrowly black; fore wing with broad discoidal bar, the terminal band narrow, its inner edge slightly waved.

Hab. Gold Coast, Ashanti, Obuassi (*Graham*), 1 ♂, 2 ♀ type. *Exp.*, ♂ 18, ♀ 20–22 mm.

Lepidopoda auripes, sp. n.

♀. Head, thorax, and abdomen black-brown mixed with yellow; palpi yellow, with some black at sides and extremity; frons white at sides; neck with yellow ring, the shoulders with yellow streaks; fore coxæ white, with dark streaks, the tibiæ and tarsi banded with yellow; abdomen with yellow bands and the anal tuft yellow. Fore wing hyaline, the veins and margins dark cupreous brown, a dark discoidal bar connected with the dark costal and inner margins. Hind wing hyaline, the veins and margins narrowly dark cupreous brown, a dark bar on upper discocellular.

Hab. Gold Coast, Ashanti, Obuassi (*Graham*), 2 ♀ type. *Exp.* 20–22 mm.

Macrotarsipus sexualis, sp. n.

Antennæ of male of normal length, with minute fascicles of cilia and dilated at extremity, of female longer and almost simple; hind wing with veins 3, 4 shortly stalked.

♂. Head, thorax, and abdomen black; neck with yellow ring; patagia with yellow streak on upper edge; abdomen with yellow rings on fifth and two terminal segments; palpi yellow in front; frons white at sides; some yellow below base of wings; fore coxæ with yellow streaks, the tarsi white above; mid tibiæ with yellow bands at middle and tips; hind legs with the spurs and the first joint of tarsus below white. Fore wing hyaline, the veins and margins black-brown; some yellow scales at base; the discoidal bar with some yellow scales on its outer edge; the terminal band expanding widely on apical area and irrorated with yellowish scales. Hind wing hyaline, the veins and margins narrowly black-brown; a black bar on upper discocellular.

♀. Palpi in front and behind and antennæ below fiery red; patagia with fiery red streak on upper edge, the metathorax with red bar; abdomen with fiery red bands on first two and last two segments and yellow band on fifth segment, the anal tuft fiery red at tip; pectus and legs with the markings fiery red; fore wing with fiery red at base and on outer side of the discoidal bar, the terminal band suffused with fiery red.

Hab. S. NIGERIA, Lagos (*Strachan*), 1 ♂, 2 ♀ type. *Exp.*, ♂ 22, ♀ 26 mm.

Larva. Bores in *Ipomœa*, the cocoon appearing half out of the burrow with the pupa projecting from it when the moth emerges.

Macrotarsipus flammipes, sp. n.

Hind wing with veins 3, 4 stalked, 6 from below upper angle of cell; hind tarsi very long, the last four joints fringed with scales above in male, naked in female.

♂. Head, thorax, and abdomen black, with a metallic-blue gloss; palpi orange-red, with a few black scales above towards extremity; frons white at sides; antennæ orange above; neck orange; tegulæ edged with orange-red; patagia with orange-red streaks above; shoulders and pectus in front orange-red; legs orange-red, the fore femora at extremity, the mid and hind femora and base of tibiæ and the hind tarsi above with some blue-black; abdomen orange-red below. Fore wing hyaline, the veins and margins metallic blue-black; a blue-black discoidal bar conjoined to the dark costal area; the inner edge of the terminal band slightly waved. Hind wing hyaline, the veins and margins narrowly black, some yellow hair on inner margin.

♀. Antennæ black, whitish above towards extremity; thorax scarlet, with blue-black patch on dorsum; abdomen scarlet, the dorsum blue-black except at base with scarlet segmental lines, a slight metallic-blue streak on dorsum of basal segment, the fourth segment with ventral black band; both wings with the inner area scarlet at base; fore wing with the terminal band broad and irrorated with yellow scales.

Hab. UGANDA, Entebbe (*Minchin*), 1 ♂, 1 ♀ type. *Exp.*, ♂ 30, ♀ 24 mm.

Sciapteron pyrocraspis, sp. n.

Antennæ of male strongly fasciculate.

♂. Head and thorax dark brown mixed with some greyish; palpi white mixed with ochreous and with some black at side of second joint; frons ochreous tinged with fiery red, white at sides and the gulæ white; antennæ with the shaft scarlet above; neck with ochreous ring; legs streaked with ochreous tinged with rufous; abdomen black-brown with ochreous-white rings and band on fifth and two terminal segments, the ventral surface with some white and scarlet scales, the anal tuft yellow at sides and below. Fore wing dark brown irrorated with fiery red; a short red streak below base of costa and slight streaks below subcostal and median nervures, the inner margin fiery red to end of cell; a hyaline streak below the cell and wedge-shaped patch in cell; a black discoidal lunule defined on outer side by fiery red; a hyaline patch beyond the cell between veins 9 and 3, with the veins on it streaked with red. Hind wing hyaline, the veins and margins brown; cilia of inner margin and at tornus yellow.

Hab. Cape Colony, Cape Town, Rondebosch (*T. D. Butler*), 1 ♂ type. *Exp.* 28 mm.

Resembles *S. doleriformis*, Wlk., but with fasciculate instead of unipectinate antennæ.

Sciapteron pyrethra, sp. n.

♀. Head fiery orange-red; palpi with some black hair at base; frons brown, with whitish patch; antennæ blackish above towards tips, the basal joint blackish; thorax and abdomen black-brown with a metallic silvery gloss; fore femora at extremity, tibiæ, and tarsi orange; mid legs scarlet, the extremity of femora black; (hind legs wanting). Fore wing fiery orange-red, with scarlet discoidal spot and traces of hyaline streaks in the interspaces beyond it; the base black with a metallic-silvery gloss; the costa irrorated with black; cilia cupreous black-brown. Hind wing hyaline, the veins, costa, and termen fiery orange-red; vein 1 *c* streaked with blackish towards termen; cilia cupreous black-brown.

Hab. Cape Colony, Grahamstown, 1 ♀ type. *Exp.* 38 mm.

Allied to *S. gracilis*, Swinh., from Burma.

Sciapteron xanthosoma, sp. n.

♂. Head rufous; palpi pale yellow in front; frons grey-brown; thorax glossy grey-brown, with some red on shoulders; legs rufous and brown, the hind coxæ whitish; abdomen golden-yellow, the base, dorsal and lateral stripes, and extremity blue-black. Fore wing rufous mixed with yellow and cupreous red. Hind wing hyaline, the veins and margins reddish brown, the inner margin cupreous red.

Hab. S. RHODESIA, Bulawayo (*Marshall*), 1 ♂ type. *Exp.* 30 mm.

Ichneumenoptera pedunculata, sp. n.

♂. Head, thorax, and abdomen black with a silvery-blue gloss; neck with a ring of white hair; palpi white in front; frons white at sides; fore coxæ with yellow annulus on inner side, the tibia with yellow streak, the spurs white; abdomen strongly constricted at base and narrowing to extremity, a ventral white band on fourth segment. Fore wing hyaline, the veins and margins black with a silvery gloss; a discoidal bar conjoined to the dark costal area; the terminal band expanding at apex. Hind wing hyaline, the veins and margins narrowly black, the cilia brownish.

Hab. GOLD COAST, Ashanti, Obuassi (*Graham*), 1 ♂ type. *Exp.* 16 mm.

Ichneumenoptera gracilis, sp. n.

♂. Head and thorax dark brown with a bluish-silvery gloss; palpi yellow, black above; frons white at sides; pectus yellow; legs brown, the extremity of tibiæ and the tarsi ringed with yellow; abdomen constricted at middle, dark brown with a bluish silvery gloss and yellow rings on third and fifth, sixth, seventh segments, the anal tuft and claspers very large with lateral white streaks. Fore wing hyaline, the veins and margins black-brown with a cupreous gloss; a prominent discoidal bar conjoined to the dark costa; the terminal band broad. Hind wing hyaline, the veins and margins narrowly black-brown with a cupreous gloss.

Hab. CAMEROONS (*Rutherford*), 1 ♂ type. *Exp.* 24 mm.

Ichneumenoptera flavipectus, sp. n.

♂. Head, thorax, and abdomen black shot with metallic blue; neck with yellow ring; patagia with yellow streaks on edges; metathorax with some yellow; palpi yellow, black behind; frons white at sides; pectus and legs yellow, the mid tarsi above and the hind tibiæ and tarsi blackish glossed with blue, the hind tibiæ ringed with yellow at middle and extremity, the first joint of tarsus streaked with yellow; abdomen slightly constricted at base and narrowing to the very long anal tuft, each segment with yellow band, the anal tuft with dorsal and lateral yellow streaks, the ventral surface whitish at base and with whitish bands; wings hyaline, the veins and margins narrowly black; fore wing with some yellow scales at base below costa and above inner margin, a narrow black discoidal bar conjoined to the dark costa, the terminal band slightly expanding at apex; hind wing with the cilia brownish.

Hab. Gold Coast, Ashanti, Obuassi (*Graham*), 1 ♂ type. *Exp.* 22 mm.

Ægeria monozona, sp. n.

♀. Head yellow tinged with fiery red, the vertex dark brown; palpi white at base and with some blackish on third joint; thorax and abdomen dark brown mixed with yellow and fiery red, the patagia with fiery-red streaks on upper edge; abdomen with red and yellow band on fifth segment, fiery-red lateral tufts towards extremity, the anal tuft red at extremity, the ventral surface with yellow bands tinged with red; fore coxæ white. Fore wing cupreous brown with the costal edge fiery red; semihyaline whitish streaks in and below the cell irrorated with brown; a large brown discoidal spot with four short hyaline streaks beyond it. Hind wing hyaline, the veins and margins brown; an oblique blackish discoidal striga; the termen and cilia cupreous brown mixed with some yellow; the underside with the costa yellow tinged with fiery red except at base.

Hab. Cape Colony, Rondebosch, 2 ♀ type. *Exp.* 24 mm.

Hepialidæ.

Dalaca fuscescens, sp. n.

Antennæ of male laminate.

♂. Head, thorax, and abdomen fuscous brown with a greyish tinge. Fore wing fuscous brown with a greyish tinge; two faint greyish spots on basal area below submedian fold with a small blackish spot between them, followed by an elliptical greyish spot above submedian fold; a greyish postmedial band defined by slight whitish lines, its outer edge oblique and slightly sinuous from apex to submedian fold where it emits a spur towards tornus, its outer edge incurved below costa, then oblique to vein 2 where it emits a slight spur below the elliptical medial spot. Hind wing fuscous brown with a greyish tinge.

Hab. Orange R. Colony, Bloemfontein (*Eckersley*), 2 ♂ type, Kroonstad (*Eckersley*), 1 ♂. *Exp.* 32–36 mm.

Allied to *D. stictigrapha*, Hmpsn.

Dalaca rhodesiensis, sp. n.

♂. Head and thorax fuscous brown; abdomen grey-brown. Fore wing fuscous brown, the base of inner area and the terminal area except at apex greyer; a faint whitish fascia below base of cell to origin of vein 2 with a black antemedial point on it and a slight curved antemedial mark above inner margin; an oblique whitish band faintly tinged with brown and with very minutely waved edges from below costa towards apex, towards which it expands somewhat to submedian fold where it emits a slight spur towards tornus, then bent upwards to the cell at origin of vein 2 and confluent with the basal fascia. Hind wing grey-brown.

Ab. 1. Fore wing with the markings almost pure white, the fascia below the cell much wider and conjoined to the mark above inner margin, the postmedial band expanding more towards costa and with the spur extending to tornus.

♀. Much paler grey-brown; fore wing with the markings much less distinct.

Hab. Mashonaland, Salisbury (*Marshall*), 13 ♂, 3 ♀ type; Gazaland, Chirinda (*Marshall*), 2 ♂. *Exp.*, ♂ 38–40, ♀ 50 mm.

Allied to *D. stictigrapha*, Hmpsn.

Dalaca goniophora, sp. n.

♂. Head, thorax, and abdomen fuscous brown. Fore wing fuscous brown, the base of inner margin pale; a narrow whitish fascia below base of cell with an antemedial black point on it near its lower edge; an oblique whitish postmedial band from vein 5 to submedian fold, then bent upwards to the cell at origin of vein 2 and confluent with the basal fascia, its outer edge with an indistinct oblique dark line from it to apex. Hind wing fuscous brown.

Hab. Transvaal, Waterval-Onder, 1 ♂ type. *Exp.* 32 mm.

Allied to *D. stictigrapha*, Hmpsn.

Dalaca tumidifascia, sp. n.

♂. Head and thorax pale red-brown; abdomen whitish tinged with rufous. Fore wing pale red-brown, the inner area whitish; a white spot below base of cell; an oblique silvery-white band from just below apex to submedian fold in which it emits a spur to termen, its inner edge curved inwards at middle, at submedian fold bent inwards with a slight upward curve to before middle, its upper edge dilated into a rounded patch to the cell; a terminal series of faint whitish spots. Hind wing silky white, the costa and termen tinged with red-brown; the underside tinged with rufous.

Hab. CAPE COLONY, 1 ♂ type. *Exp.* 34 mm.

Allied to *D. exul*, H.-S.

Dalaca metaleuca, sp. n.

♂. Head and thorax dull reddish brown; abdomen whitish tinged with rufous. Fore wing pale reddish brown, the base of inner area ochreous white; an oblique silvery-white band slightly defined by blackish from below apex to submedian fold where it emits a spur to tornus, its edges slightly waved and its inner edge expanding at middle, at submedian fold curved upwards to the cell, then down to vein 1 before middle where there is a black point on its inner edge; a terminal series of small white spots. Hind wing creamy white, the costa and cilia reddish brown; the underside slightly tinged with reddish brown.

Hab. PONDOLAND, Uggeleni (*Swinny*), 1 ♂ type; NATAL, Karkloof (*Quekett*), 1 ♂. *Exp.* 32–36 mm.

Allied to *D. exul*, H.-S.

Dalaca furva, sp. n.

♂. Head, thorax, and abdomen fulvous with a yellowish tinge. Fore wing fulvous with a yellowish tinge; a faint whitish streak below base of cell; a very indistinct slightly paler oblique postmedial band faintly defined by dark lines from below costa towards apex, towards which it expands, to submedian fold, then bent upwards to the cell beyond the basal streak; cilia whitish at tips. Hind wing fulvous with a yellowish tinge, the cilia whitish at tips.

Hab. TRANSVAAL, White R. (*Cooke*), 1 ♂ type. *Exp.* 30 mm.

Dalaca rufescens, sp. n.

♂. Head, thorax, and abdomen pale rufous. Fore wing pale rufous; an oblique pale rufous band defined by minutely waved silvery-white lines from well below costa towards apex, towards which it expands to submedian fold where it is bent inwards with a slight upward curve to before middle and emitting a streak to base; a terminal series of slight whitish lunules; cilia whitish at tips. Hind wing pale rufous, the cilia white at tips.

♀. Paler and greyer; fore wing with the band much less distinct and expanding widely towards costa.

Hab. TRANSVAAL, Rand, 1 ♀; ORANGE R. COLONY, Bethlehem (*Arnold*), 1 ♂; NATAL, Howick (*Cregoe*), 2 ♂, Shafton (*Parkinson*), 1 ♀. *Exp.*, ♂ 34, ♀ 44–58 mm.

Dalaca leucocyma, sp. n.

♂. Head, thorax, and abdomen reddish brown mixed with some white. Fore wing yellowish brown; a white fascia below costa to beyond middle with a small elongate spot below its extremity at upper angle of cell; a wedge-shaped white mark below base of cell with a small elongate mark above its extremity in the cell; a white fascia on basal half of inner margin with a slight streak above it on vein 1; postmedial band silvery white, narrow, oblique from just below apex to vein 2, its edges slightly waved and incurved below vein 4, at vein 2 bent inwards with an upward curve to above extremity of the wedge-shaped basal mark; a terminal series of white marks forming small spots towards apex and short streaks between veins 5 and 2. Hind wing whitish suffused with yellow-brown.

Hab. CAPE COLONY, Deelfontein (*Sloggett*), 1 ♂ type. *Exp.* 24 mm.

Allied to *D. ibex*, Wllgrn.

Dalaca albirivula, sp. n.

♂. Head, thorax, and abdomen white slightly tinged with yellow-brown; antennæ fulvous. Fore wing white faintly tinged with yellow-brown with deeper yellow-brown in cell and on each side of postmedial band; the costal edge dark brown with a silvery-white fascia below it and slight white streaks beyond upper angle of cell; a narrow oblique silvery-white postmedial band from just below apex to vein 2, its edges slightly sinuous and incurved below vein 5, at vein 2 bent inwards along median nervure to base with an upward curve into the cell, then straight towards base; the terminal area with ill-defined white streaks in the interspaces between veins 5 and 2. Hind wing creamy white, the apical area tinged with yellow-brown. Underside of both wings suffused with yellow-brown.

Hab. ORANGE R. COLONY, Bloemfontein (*Wilson*), 1 ♂ type. *Exp.* 34 mm.

Allied to *D. ibex*, Wllgrn.

Dalaca albistriata, sp. n.

♂. Head, thorax, and abdomen white tinged with yellow-brown; antennæ fulvous. Fore wing fulvous yellow; a silvery-white fascia below costa; a silvery-white fascia from base along median nervure to middle of cell, then curved upwards to apex towards which it becomes maculate; a series of silvery-white marks in interspaces of terminal area, reduced to small spots towards apex and becoming elongate streaks between veins 5 and 1, the streaks above veins 4 and 3 sometimes confluent with the white fascia. Hind wing fulvous yellow.

Hab. NATAL, Howick (*Cregoe*), 2 ♂ type; BASUTOLAND, Pithaneng Valley (*Crawshay*), 1 ♂. *Exp.* 24 mm.

Allied to *D. ibex*, Wllgrn.

Dalaca hololeuca, sp. n.

Head, thorax, and abdomen white slightly mixed with brown; antennæ fulvous; sides of frons and legs brown. Fore wing white with a very faint ochreous-brown tinge, the veins whiter, the costal edge brown. Hind wing white with a very faint ochreous-brown tinge. Underside of both wings suffused with pale brown.

Ab. 1. Fore and hind wings more strongly tinged with brown.

Hab. TRANSVAAL (*Pead, Cholmley*), 2 ♀; NATAL, Estcourt (*Hutchinson*), 2 ♂ type; ORANGE R. COLONY, Bethlehem (*Arnold*), 1 ♂. *Exp.*, ♂ 34, ♀ 34–40 mm.

XVI.—*Descriptions and Records of Bees.*—XXXI.

By T. D. A. COCKERELL, University of Colorado.

Prosopis xanthaspis, sp. n.

♀.—Length about 7 mm.

Head and thorax black, abdomen black with a faint blue tinge; head entirely black, face finely striatulate, front and vertex punctured; flagellum dull ferruginous beneath; mesothorax finely but distinctly punctured; tubercles broadly, scutellum (except anterior margin), postscutellum, and sometimes axillar triangle all bright chrome-yellow, no other yellow about the insect; legs black; area of metathorax roughened basally. Wings clear, the recurrent nervures meeting the transverso-cubitals, or nearly. Abdomen dull at base, more shining beyond. Runs in table of Australian *Prosopis* to 43, and runs out because of the lack of yellow on pleura; if placed among the metallic species, runs to 14, and runs out because the face is without light markings.

Hab. Mackay, Queensland (*Turner*). British Museum.

Two are from flowers of *Cassia*, Dec. 1899. Four are from *Eucalyptus* flowers, also Dec. 1899. Two were collected March 1900.

Prosopis nubilosella, sp. n.

♀.—Length about 7 mm.

Superficially like *P. xanthaspis*, with which I had confused it, but easily distinguished by the following characters:—Face not entirely black, but with three minute yellow marks, a narrow cuneiform one on clypeus, and a short line along each orbital margin at sides of front. Wings considerably larger and longer, with the apical field distinctly dusky; second submarginal cell considerably larger and longer, receiving the recurrent nervures some distance from its base and apex. Abdomen pure black, distinctly punctured, with the apical part more hairy. In the table of *Prosopis* it runs to 43 if the minute face-markings are overlooked; otherwise it runs to *P. nubilosa*, Smith, to which it is evidently closely related, differing in the smaller size, rounder head, larger punctures of mesothorax, &c.

Hab. Mackay, Queensland, May 1900 (*Turner*, 692). British Museum.

Another was taken April 1899, at flowers of *Xanthorrhœa*.

Prosopis nubilosa subnubilosa, Ckll.

This subspecies was described from the female. The male is smaller (size and appearance of ♀ *nubilosella*), with a narrower face, the clypeus creamy-white except a narrow cuneiform black mark on each side, the scape with a white mark in front, and the upper border of prothorax with a very fine interrupted yellow line. This is nearly the same as *P. aureomaculata*, Ckll., differing by the absence of a supraclypeal mark and in the venation. The second submarginal cell receives the recurrent nervures some distance from apex and base.

Hab. Mackay, Queensland, at flowers of *Leptospermum*, Aug. 1900 (*Turner*). British Museum.

Prosopis bicuneata, sp. n.

♀.—Length nearly 6 mm.

Black, the abdomen faintly bluish; face-markings consisting of broad-cuneate bright lemon-yellow lateral marks, filling the space between clypeus and eyes, pointed below, rather obliquely truncate above; clypeus finely striatulate, not evidently punctured; flagellum reddish brown beneath; mesothorax very finely punctured; tubercles, scutellum, axillæ, and postscutellum bright chrome-yellow; area of metathorax roughened basally; legs black, anterior tibiæ reddish basally in front, and with a small cream-coloured streak, hind tibiæ with a subbasal cream-coloured spot. Wings hyaline, scarcely dusky, recurrent nervures meeting transverso-cubitals. Except for the faint bluish tint of abdomen, this runs in the table to *P. frederici* *. According to Smith, *frederici* has the abdomen "obscurely tinged with blue," but it is so faint that I overlooked it when examining the type. *P. frederici* is, however, larger, and has the abdomen "covered with a changeable white pile, observable in certain lights." Run among the metallic species, *P. bicuneata* goes to 19, and runs out because of the very fine sculpture, combined with cuneate face-marks.

Hab. Mackay, Queensland, March 1900 (*Turner*).

Superficially the insect is like *P. xanthaspis*.

Prosopis rollei, Ckll.

In the Turner collection are two females and three males from Victoria (*C. F.*). The females are *P. elegans*, Sm., agreeing with a specimen from Adelaide, the type locality, though the abdomen is much more clouded with black than Smith describes. The males are *P. rollei*, Ckll., described from Ararat, Victoria. Smith describes the male of *P. elegans* as having the postscutellum black, and the abdomen "having only the two basal segments and a line down their centre black"; but this statement about the abdomen is erroneous, and was evidently meant to read "only the two basal segments red, a line" &c. *P. sydneyana*, Ckll., which I determined as *elegans* by comparison of types, represents a variety with the postscutellum yellow.

P. rollei is readily separable from *elegans* in the male, but it may be that females at present ascribed to *elegans* belong in part to *rollei*.

Prosopis coronata, Ckll.

This was described from the male. Turner's 871 (Mackay, Nov. 1893) appears to be its female. It is about 6 mm. long, more robust than the male, but with the same finely punctured mesothorax, red abdomen, &c. The clypeus, labrum, and mandibles are red, and there are narrow, almost linear, lateral face-marks running along the orbits and ending a little below level of antennæ. Antennæ entirely bright ferruginous, short, the flagellum thick, its middle joints much wider than long; knees, tibiæ, and tarsi red, the middle tibiæ with a blackish cloud on outer side; area of metathorax coarsely irregularly cancellate; thorax without light markings. In the table this runs straight to *P. subplebeia* male.

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* Ann. & Mag. Nat. Hist., Feb. 1910, p. 140, line 4, dele "not," and read "Lateral face-marks ending" &c.

Prosopis philoleuca, sp. n.

♀.—Length about 4 mm.

A short robust species like *P. amiculiformis*, but smaller, and with the light markings all white—namely, broad-triangular lateral face-marks (ending in a point on orbit a little above antennæ, the upper inner side of the triangle a little longer than the lower inner), tubercles, a narrow interrupted line on upper border of prothorax, and a basal spot on each tibia, that on hind tibia involving the basal two-fifths; flagellum thick, ferruginous beneath; front and mesothorax extremely minutely punctured; area of metathorax shining, sculptured at extreme base; tegulæ very dark brown. Wings clear; second submarginal cell receiving both recurrent nervures. Abdomen subglobose. Runs in the table to 35, and runs out because clypeus is black and face-marks are white.

Hab. Mackay, Queensland, May 1900 (*Turner*). British Museum.

Prosopis nigrifrons, Smith, var. *a*.

♀.—Length fully 10 mm.

Front closely punctured but shining; area of metathorax elevated, granular, not strigose; first r. n. joining second s.m. more than a third from base, the distance being equal to about four-fifths length of first t.-c.; margins of abdominal segments black.

Hab. Victoria (*C. F.*). Turner Collection, British Museum.

Prosopis itamuca, sp. n.

♀.—Length about 10 mm.

In nearly all respects agreeing with *P. nigrifrons*, var. *a* (a noteworthy little feature common to both is a red spot at the base of the scape), but differing thus: light markings of thorax (tubercles, large patch behind, scutellum, and postscutellum) brilliant chrome-yellow or orange (lemon-yellow in *nigrifrons*, var. *a*). Wings darker and especially much redder; first r. n. joining second s.m. much nearer base, the distance being hardly half length of first t.-c., and very much less than a third length of s.m.; area of metathorax longitudinally strigose.

Hab. N.W. Australia (*C. F.*). Turner Collection, British Museum.

C. F. is doubtless Charles French, of Melbourne.

Prosopis aposuara, sp. n.

♂.—Length 7 mm.

Head and thorax black, closely and minutely punctured; abdomen dark purplish; head and face ordinary, the latter entirely light yellow below the antennæ, except the very narrow lower edge of clypeus, but labrum and mandibles black; lateral marks broadly truncate above at level of antennæ, the edge of the truncation irregular; supraclypeal mark long and narrow, with about half its length above the general level of the facial yellow, its upper end truncate but deeply notched in the middle; scape with a yellow stripe; flagellum dark above, ferruginous beneath; upper border of prothorax with a feeble interrupted yellow line; tubercles, scutellum, and postscutellum bright chrome-yellow; area of metathorax longitudinally wrinkled, and with a strong transverse ridge near the base; tegulæ reddish brown. Wings a little dusky toward apex; second s.m. long; first r. n. meeting first t.-c. Legs obscure reddish, anterior and middle tibiæ testaceous in front. Abdomen finely punctured. In the table this runs to *P. purpurata*, from which it is readily known by the pale yellow face and black mandibles, as well as the colour of the legs. To the same place runs *P. lubbocki*, but this is separated by the colour of the legs, and especially the black hair on the apical part of the abdomen beneath, this place in *P. aposuara* having exceedingly fine wholly pale hair. It may also be compared with *P. chrysognatha*, but that has the face bright yellow, the legs with much yellow, and the abdomen not purplish. The absence of a constriction between the first and second dorsal abdominal segments at once separates it from *P. elongata*.

Hab. Mackay, Queensland, at flowers of *Xanthorrhœa*, April 1899 (*Turner*). British Museum.

This is the male of Turner's 1047; the females labelled with the same number (Mackay, two May 1900, one Oct. 1899, at flowers of *Eugenia*) agree with *P. rotundiceps*, Smith, so far as I can make out. They have the same transverse keel on the base of the metathorax as the male, but the mesothorax is more coarsely punctured, and they are of course larger and more robust. There is no supraclypeal mark. I should have referred both sexes of 1047 to *rotundiceps*, had I not seen both sexes of *rotundiceps*, with a quite different male, from New South Wales. The type locality of *rotundiceps* is Melbourne, and it was to be expected that the Mackay insect would differ. The Mackay females were not taken with the male, and may not belong to it; their status must for the present remain somewhat doubtful.

Prosopis chrysognatha, Ckll.

♀.—Sydney, New South Wales, Nov. 1905 (*Turner*). British Museum.

This agrees with Smith's description of *P. simillima*, except that the first r. n. practically meets the first t.-c. The male of *chrysognatha* is readily separated from *simillima*.

Prosopis cyaneomicans, sp. n.

♀.—Length about 6 mm.

Slender, head and thorax black, abdomen brilliant shining blue; head ordinary, but wholly without pale markings; clypeus striatulate and punctured; front shining, well punctured; flagellum light ferruginous beneath, dusky ferruginous above; mesothorax and scutellum shining, with strong well-separated punctures; metathorax large and prominent, the basal area transversely striate; tubercles with a white spot, but thorax with no other light markings; tegulæ shining piceous. Wings clear; nervures and stigma dark reddish brown, first r. n. meeting first t.-c. Legs black, hind tibiæ white at extreme base. Abdomen little sculptured, the basal segment especially smooth and shining, apical part with black hair. In the table this runs to 12, and falls nearest to *P. cyanophila*, differing greatly by the shining and brilliantly coloured abdomen. It is not unlikely that when the male is discovered it will be seen to be a *Meroglossa*.

Hab. Mackay, Queensland, at flowers of *Cassia*, Dec. 1899; also at flowers of *Rosa*, 1900, and one Jan. 1901 (*Turner* 710). British Museum.

Prosopis cenibera, sp. n. (*lateralis*, subsp.?).

♀.—Appearance of *P. lateralis*, Smith, for which I had taken it, but it differs in the form of the metathorax, the area being well defined and boat-shaped, its surface dull with a few indistinct raised lines; other differences are, hind tibiæ cream-coloured at base, creamy-white lateral face-marks linear. The metathorax may be all red at sides or only red-spotted. This is perhaps only a subspecies of *P. lateralis*.

Hab. Mackay, Queensland, at flowers of *Xanthorrhœa* April 1899 (*Turner*, 856). British Museum. Another, collected Nov. 1893, bears the number 858.

There are two small cream-coloured marks on upper border of prothorax. A variety (*Turner*, 858, Nov. 1893) is larger and more robust (about 6 mm. long), with the stigma honey-colour and the metathorax red except the enclosure. The lateral face-marks are broader, as in *lateralis*.

Prosopis euxantha, n. n.

Prosopis xanthopoda, Ckll. Ann. & Mag. N. H., July 1910, p. 28 (not of Vachal, 1895).

Pachyprosopis mirabilis, Perkins.

♀.—Mackay, Queensland (*Turner*, 868). March and May 1900; one is from flowers of *Eucalyptus*. The mesothorax and scutellum vary from dark green to dark purple.

Pachyprosopis plebeia, sp. n.

♀.—Length 6½–7 mm.

General build and appearance much as in *P. mirabilis*, but the head, while thick, is not in any way extraordinary, being as in *Euryglossa*. Head black, face broad; labrum and mandibles (except apex) dark red; clypeus with distinct well-separated punctures, front minutely punctured; linear facial foveæ curving above and running to lateral ocelli; scape light orange; flagellum thick, entirely clear ferruginous; thorax black, with the very minutely punctured mesothorax tile-red, sometimes clouded with black at sides; scutellum with minute punctures on a shining ground, its anterior border sometimes red, area of metathorax not noticeably sculptured, sides of metathorax with conspicuous white hair; tegulæ very dark brown. Wings clear, nervures and stigma yellowish brown; venation as in *P. mirabilis*, but the second s.m. is not so narrow, and the basal nervure is more arched. Femora black, ferruginous at apex; tibiæ and tarsi clear ferruginous, the anterior tibiæ more or less yellow in front. Abdomen red, a shade darker than in *P. mirabilis*, the first segment sometimes blackened basally, when two small orange spots appear upon the black.

Hab. Mackay, Queensland, Nov. 1893 and Jan. 1901 (*Turner*, 857). British Museum.

Pachyprosopis doddi, sp. n.

♀.—Length about 6 mm.

Very close to *P. plebeia*, with the same red mesothorax, the same venation, &c., but differing thus: scape ferruginous like the flagellum; scutellum red; anterior tibiæ not yellow in front; first abdominal segment dark, except the apical sides broadly, but no light spots; red of abdomen duller.

Hab. Townsville, Queensland, 2. 1. 03 (*F. P. Dodd*). British Museum.

The new species of *Pachyprosopis* indicate that the genus is essentially like *Euryglossa*, differing, however, in the shape of the submarginal cell.

Pachyprosopis semisericea (Ckll.).

Stilpnosoma semisericeum, Ckll., 1905, is better placed in this genus.

Euryglossa rubricata, Smith, and allies.

I formerly recorded Turner's 859 as *E. rubricata*, but it now appears that there are three species of the *rubricata* type, separable thus:—

Mesothorax finely rugose in front, posteriorly with strong rather close punctures; scape red; scutellum red, but axillæ, postscutellum (which is rugose), and metathorax black; last two segments of abdomen black. (Mackay, Queensland, at flowers of *Leptospermum*, Oct. 1898, *Turner*, 859, ♀.)	*E. leptospermi*, sp. n.
Mesothorax and scutellum shining, with fine scattered punctures	1.
1. Apex of abdomen red, like the part before; antennæ very dark fuscous, the flagellum beneath largely pale yellowish ferruginous; axillæ and postscutellum red. (Victoria, *C. F.*; Turner collection.)	*E. frenchii*, sp. n.
Apex of abdomen blue-black; antennæ ferruginous; the flagellum fuscous above. (Swan River.)	*E. rubricata*, Smith.

The types of the new species are in the British Museum. Other characters are:—

E. leptospermi.—Clypeus well punctured; knees, tibiæ, and tarsi ferruginous; hind spur strongly dentate.

E. frenchii.—Clypeus and supraclypeal area smooth, hardly punctured, the suture between them broadly suffused with dark reddish; anterior tibiæ blackish on outer side; hind femora red beneath.

Euryglossa chrysoceras, Ckll., and *E. subsericea*, Ckll.

A male *E. chrysoceras* comes from The Ridges, Mackay, Queensland, at flowers of *Leptospermum*, Oct. 1898 (*Turner*, 702). British Museum. At the same flowers were taken females of *E. subsericea*, Ckll., and these also bear the number 702, being evidently considered conspecific with *chrysoceras*. The two insects are so different that it seems improbable that they can be sexes of one, and, moreover, I believe the true male of *E. subsericea* to be Turner's 1 *a*, taken in some numbers at flowers of *Leptospermum*, at the same locality, Sept. and Oct. 1898. This insect has every appearance of *E. subsericea*, except for the usual sexual differences and the fact that the head and thorax are dark green instead of black. A very characteristic feature, seen in both sexes, is the dull minutely sculptured front, abruptly contrasting with the shining strongly punctured vertex. The abdomen of the male is shining, in the female it is dull. The venation varies, the first r. n. sometimes squarely meeting the first t.-c. The male (Turner's 1 *a*) is the insect mentioned by Baker ('Invertebrata Pacifica,' May 1906, p. 141) as *Stilpnosoma turneri*. Prof. Baker has kindly sent me his specimen, which proves to be from Mackay, Sept. 1898, collected by Turner, the name *S. turneri* being a manuscript one by Friese.

XVII.—*Descriptions of some new Species of Heterocera from East and West Africa and Tropical South America.* By HERBERT DRUCE, F.L.S. &c.

Fam. **Agaristidæ.**

Copidryas peruviana, sp. n.

Male.—Head, collar, tegulæ, and thorax brown, thickly irrorated with grey hairs; antennæ and palpi black; abdomen yellow, with a black tuft of hairs at the base, the underside greyish yellow, the legs yellow. Primaries pale brown, thickly irrorated with white and greenish-coloured scales; two zigzag black lines cross the wing beyond the cell from the costal to the inner margin; a small brown spot in the cell; the inner margin brown from the base to the anal angle; the fringe alternately brown and white: secondaries chrome-yellow, bordered with black from the apex almost to the anal angle;

the fringe alternately black and grey. Underside of both wings pale yellow, irrorated with brown scales: primaries with a black dot at the end of the cell, and beyond a broken black bar that does not reach either margin, the apex and outer margin brown.—*Female* the same as the male, but rather darker in colour.

Expanse 2¾ inches.

Hab. S.E. Peru, Santo Domingo, 6000 feet, wet season (*G. Ockenden*, *Mus. Druce*).

Tuerta rema, sp. n.

Male.—Head, palpi, and antennæ black, the base of the antennæ white; collar, tegulæ, and thorax reddish brown, thickly irrorated with white hairs; abdomen pale yellow. Primaries: the costal half of the wing from the base to beyond the cell white, the outer half of the cell pale green; a reddish-brown band extends from the apex to the anal angle and along the inner margin to the base of the wing thickly irrorated with white scales, the inner side of the brown band broadly olive-green, the outer margin and fringe white: secondaries pale yellow, the fringe white; a small black line close to the anal angle. Underside of both wings uniformly pale yellow.

Expanse 1½ inch.

Hab. German East Africa (*Mus. Druce*).

Fam. **Arctidæ.**

Diacrisia pales, sp. n.

Male.—Head, collar, tegulæ, and front of the thorax orange-yellow, the thorax and basal part of the abdomen pale yellow, antennæ and legs black, the abdomen black, the anus yellow. Primaries pale yellow: secondaries yellowish white, darkest along the inner margin.—The *female* the same as the male.

Expanse 1¾ inch.

Hab. German East Africa (*Mus. Druce*).

Allied to *Diacrisia lurida*, Druce.

Lophocampa dissimilis, sp. n.

Male and female.—Head chrome-yellow; palpi and antennæ black; collar white, edged with chrome-yellow; tegulæ chrome-yellow, edged with white; thorax and abdomen black, some yellowish-brown hairs at the base of the thorax, abdomen spotted with yellow on the upper side and sides, the two anal segments, the anus, and underside yellowish white; the legs black. Primaries sordid white, the apex and part of the outer margin clouded with pale brown, the veins and a bar at the end of the cell pale brown, the fringe greyish white: secondaries similar to the primaries, but more dusky on the inner margin.

Expanse, ♂ 2, ♀ 2¼ inches.

Hab. Peru, Chanchamayo, 1000 to 1500 metres (*Mus. Druce*).

This species is allied to *Lophocampa humosa*, Dogn., from Ecuador.

Pericopis imitata, sp. n.

Male.—Head, antennæ, collar, thorax, base of the abdomen, and legs black; two yellow spots at the back of the head and two at the base of the primaries; abdomen black, with a row of bluish-grey spots on each side, below which on the sides a row of very minute white dots; the underside spotted with yellow; the anal tuft bright red. Primaries very similar to those of *P. arema*, Boisd., but browner and not so hyaline, without the broad black band across the wing at the end of the cell as in *P. arema*; a faint marginal zigzag line extends from the apex to the anal angle; the fringe black: secondaries pale yellowish white, very broadly bordered with black at the end of the cell; two yellowish-white spots; a marginal row of white spots from near the apex to the anal angle. The underside very similar to the upperside, a red spot at the base of both wings.

Expanse, ♂ ♀, 3 inches.

Hab. Peru, Limbani, Carabaya, 9500 feet, 3 ♂, 1 ♀; Rio Huacamayo, 3100 feet, 2 ♂; Oconeque, 7000 feet, 1 ♂; Aqualani, 10,000 feet, 4 ♂ (*G. Ockenden*). Brazil, 1 ♂ (*ex Staudinger, Mus. Druce*).

Near *P. arema*, Boisd., but at once distinguished from that species by the bluish-grey sides to the abdomen.

Pericopis titan, sp. n.

Female.—Head, antennæ, palpi, collar, tegulæ, thorax, abdomen, and legs all black; collar spotted with white; a yellow spot at the base of the tegulæ; the sides of the abdomen greenish grey, with a row of white dots below the underside yellow. Primaries blackish grey, marked with black very much the same as *Pericopis imitata*, Druce: secondaries white, broadly bordered with black; two white spots just beyond the cell; the veins black; a marginal row of rather large white spots extends from the apex to the anal angle. Underside similar to the upperside; a large red spot at the base of both wings and a white spot on each side of the thorax.

Expanse 3 inches.

Hab. Peru, Chanchamayo, 1000 to 1500 metres (*Mus. Druce*).

Pericopis palmeri, sp. n.

Male.—Head, antennæ, collar, tegulæ, thorax, and legs black; tegulæ edged with yellow; abdomen black; a row of large yellow spots on both sides; the underside yellow; anal tuft red. Primaries dark brown; a red spot at the base; a yellow streak on the inner margin; the semihyaline markings very similar to those of *Pericopis imitata*, Druce, but mostly edged with yellow; the spot in the cell extends to the base; a fine submarginal yellow line extends from the apex to the anal angle; the fringe dark brown: secondaries white, the veins and a bar at the end of the cell black; the outer margin broadly black, with a row of red spots from the apex to the anal angle and a marginal row of white dots also from the apex to the anal angle. Underside: primaries the same as above, but with several reddish marks along the outer margin: secondaries similar to the upperside, the costal margin red.—*Female.* Head, antennæ, collar, tegulæ, and thorax black; abdomen the same as the male. Primaries brown, the markings much more indistinct: secondaries pale yellow, very broadly bordered with black; a yellow spot at the end of the cell; the costal margin red; the marginal red and white spots the same as the male; the fringe black. Underside: primaries very similar to the upperside, but much paler in colour: secondaries the same as the upperside, with all the red markings very bright in colour; the white row of marginal spots are larger and more distinct.

Expanse, ♂ 2¾, ♀ 3⅛ inches.

Hab. West Colombia, San Antonio, 5800 feet (*G. M. Palmer*); East Peru, Puzuzo (*J. Egg*, 2000–4000 feet, *Mus. Druce*).

Pericopis damon, sp. n.

Female.—Head, antennæ, collar, tegulæ, and thorax black, the head, collar, and tegulæ spotted with white; abdomen black above, yellowish white on the underside; legs black. Primaries dusky hyaline, the apex, outer and inner margin broadly black; two black bands cross the wing, that nearest the base from the costal to the inner margin; the band at the end of the cell from the costal to the outer margin; the veins all black: secondaries yellowish hyaline, broadly bordered with black from the apex to the anal angle; a marginal row of rather large white spots extends from the apex to the anal angle; a black band crosses the wing at the end of the cell from the costal to about the middle of the outer margin; the veins and fringe black. Underside very similar to the upperside, but slightly more yellow in tone.

Expanse 3½ inches.

Hab. Peru, Chanchamayo, 1000–1500 metres (*Mus. Druce*).

Pericopis semirufa, sp. n.

Female.—Head and antennæ black, head spotted with white; collar black, spotted with yellow; tegulæ black, with a yellow spot at the base; thorax brownish black; abdomen reddish brown, yellow on the underside; legs black. Primaries brownish hyaline, the costal margin, apex, outer and inner margin, and two bands crossing the wing all black: secondaries reddish hyaline, the outer margin black, with a marginal row of white spots extending from the apex to the anal angle; above the black margin a red band extends from the apex to the anal angle; the fringe black. Underside very similar to the upperside; primaries with a red band at the apex and a reddish spot above the anal angle; secondaries with the costal margin red.

Expanse 3¾ inches.

Hab. Peru, Chanchamayo, 1000–1500 metres (*Mus. Druce*).

Pericopis sylvia, sp. n.

Female.—Head, palpi, antennæ, collar, tegulæ, and thorax black, collar and tegulæ spotted with white; abdomen grey, the sides black; the underside pale yellow; legs black. Primaries greyish hyaline, the costal margin, apex, outer and inner margin black; a reddish-brown line extends along the inner margin from the base nearly to the apex; a black band crosses the wing about the middle of the cell from the costal to the inner margin; a black band at the end of the cell, a few white dots at the apex, and several indistinct brown spots on the inner side of the white dots: secondaries semihyaline white, the veins and a bar at the end of the cell black; the outer margin broadly black from the apex to the anal angle, and a marginal row of rather large white spots. Underside very similar to the upperside, but with the costal margin of the secondaries from the base almost to the apex chrome-yellow.

Expanse 3½ inches.

Hab. Peru, Chanchamayo, 1000–1500 metres (*Mus. Druce*).

Pericopis madana, sp. n.

Female.—Head, palpi, antennæ, collar, tegulæ, thorax, and abdomen black, the collar spotted with white, abdomen with a bluish-grey band on each side; the underside pale yellow; legs black. Primaries brownish grey, the apex, inner margin, and two bands crossing the wings all black; several small white spots at the apex, below which are some indistinct reddish-brown spots, also two reddish-brown spots close to the anal angle; a bright red spot at the base: secondaries white, the veins all black; the inner half of the wing thickly clothed with black hairs; the outer margin broadly bordered with black, with a submarginal row of indistinct reddish spots and a marginal row of white spots extending from the apex to the anal angle; the fringe black. Underside similar to the upperside, but with nearly all the black markings red.

Expanse 3 inches.

Hab. West Colombia, San Antonio, 5800 feet (*G. M. Palmer, Mus. Druce*).

A very distinct species, quite unlike any other known to me.

Pericopis hodeva, sp. n.

Female.—Head, antennæ, collar, tegulæ, thorax, and legs all black; collar spotted with yellow, tegulæ edged with reddish brown; abdomen above reddish brown, with a central black line down the middle from the base to the anus; a double black line on each side; the underside pale yellow; the anal segment bluish grey. Primaries: the apical third of the wing black, from the end of the cell to the base brownish yellow, clouded in the cell and along the inner margin with brown; the veins black; the fringe black; a yellow line at the end of the cell; secondaries black, yellowish brown at the apex and half round the outer margin. Underside very similar to the upperside, but brighter in colour, and a distinct black spot about the middle of the cell on the primaries.

Expanse 3½ inches.

Hab. Peru, Puzuzo (*Mus. Druce*).

Pericopis rhea, sp. n.

Female.—Head, palpi, antennæ, collar, and tegulæ black, collar spotted with yellow; thorax yellowish brown, clothed with some black hairs; abdomen yellowish brown, with a central black line from the base to the anus; a narrow black line on each side; the underside pale yellow. Primaries: the apical third of the wing brownish black, the other two-thirds of the wing dark orange-yellow, the veins black; a black bar at the end of the cell and an ill-defined black band crossing the wing from the costal margin to the upperside of vein 2; the fringe black: secondaries dark orange-yellow, the outer margin and a wide band partly across the middle of the wing below the cell black. Underside very similar to the upperside, but brighter in colour.

Expanse 3¾ inches.

Hab. Peru, Pachitea (*Mus. Druce*).

Pericopis staudingeri, sp. n.

Female.—Head, palpi, antennæ, collar, tegulæ, and thorax black, head and tegulæ spotted with white; abdomen red, with a central black band extending from the base to the anus; a black band on each side; the underside yellow; legs black. Primaries brownish black, crossed from the costal margin nearest the apex to the anal angle by a cream-coloured wide band; a black bar at the end of the cell: secondaries bright red, the outer margin black from the apex to the anal angle; a broken black band crosses the wing below the middle. Underside very similar to the upperside, with the inner margin of the primaries yellowish brown; the secondaries with a large round yellow spot at the end of the cell.

Expanse 3½ inches.

Hab. Peru, Cuzco (received from the late Dr. Staudinger); S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden, Mus. Druce*).

Pericopis buckleyi, sp. n.

Female.—Head, palpi, antennæ, collar, tegulæ, thorax, abdomen, and legs black. Primaries dark brown, darkest at the base; a red spot on the costal margin close to the base; the fringe dark brown: secondaries black, three pale yellow spots between veins 5, 6, and 7 near the apex; a rose-coloured band extending from the anal angle to vein 4; the fringe black. The underside the same as the upperside: the secondaries with a red spot at the base.

Expanse 4 inches.

Hab. Ecuador, Sarayacu (*C. Buckley, Mus. Druce*).

Pericopis salome, sp. n.

Female.—Head, palpi, antennæ, collar, tegulæ, thorax, abdomen, and legs black. Primaries dark brown, very similar to *Pericopis rosena*, Butler: secondaries black; a yellow spot at the end of the cell and one beyond nearest the apex; a wide rose-coloured band extends from the inner margin to the cell, the outer margin of the band broken into streaks; the fringe black. Underside of the primaries dark brown; four pale yellow spots beyond the cell and a pale yellow band from the end of the cell to the inner margin above the apex: secondaries the same as above, but browner in colour.

Expanse 2½ inches.

Hab. Ecuador (*C. Buckley, Mus. Druce*).

Allied to *Pericopis rosina*, Butler, Lep. Exot. p. 77, t. xxx. fig. 1.

Pericopis unxia, sp. n.

Male.—Head, palpi, and antennæ black; collar black, with four yellow spots; tegulæ black, with a large yellow spot at the base; thorax black; abdomen yellow, a central black line extends from the base to the anus, a black line on each side; the underside pale yellow, the anal tuft orange; legs black and yellow. Primaries dusky hyaline, very similar to those of *Pericopis sibylla*, Butler; a marginal row of small white dots extends from the apex to the anal angle: secondaries very pale yellow, broadly bordered with black; a marginal row of small white dots extending from the apex to the anal angle; a fine black line crosses the wing beyond the cell; an indistinct red line at the apex; the fringe black. Underside very similar to the upperside, but much more yellow in colour; the costal margin of the secondaries reddish brown; a red spot at the base of all the wings.

Expanse 2¾ inches.

Hab. Peru, La Union, Rio Huacamayo, Carabaya, 2000 feet; Santo Domingo, 6000 feet (*G. Ockenden, Mus. Druce*).

Fam. Lithosidæ.

Chrysochlorosia superba, sp. n.

Male.—Head, collar, tegulæ, thorax, and abdomen metallic green; antennæ metallic green, the tips white; the anus bright metallic blue; the underside of the abdomen reddish; the legs metallic blue-green. Primaries metallic orange-blue and green, broadly bordered with black on the outer margin; the fringe bright metallic blue: secondaries black. Underside of both wings greenish black.

Expanse 1¼ inch.

Hab. Colombia, Rio San Juan, 250 feet (*G. M. Palmer, Mus. Druce*).

Ptychoglene phœbe, sp. n.

Male.—Head, antennæ, tegulæ, and thorax brownish black; collar white; abdomen black, each segment edged with white; underside of the abdomen white; legs brownish black. Primaries orange-yellow, the costal margin, apex, and outer margin broadly black, the inner margin edged with black; the fringe black: secondaries orange-red, bordered with black from the apex to the anal angle; two black streaks at the base of the wing; the apical half of the fringe black, the anal half orange-red. Underside very similar to the upperside, but paler in colour.

Expanse 1$\frac{4}{10}$ inch.

Hab. East Peru, Huancabamba, 6000–10,000 feet (*Boettger, Mus. Druce*).

Fam. Lasiocampidæ.

Chrysopoloma opalina, sp. n.

Male.—Head, collar, tegulæ, thorax, abdomen, and legs pale cream-colour; antennæ pale brown. Primaries pale cream-colour; an indistinct row of brownish-black dots crosses the wing from near the apex to the inner margin close to the anal angle, the spot on the inner margin much the largest: secondaries pale cream-colour, crossed from the apex to the inner margin by a double row of indistinct black dots, also a marginal row of very indistinct dots extends from the apex to the anal angle; the fringe of both wings pale cream-colour.—*Female* very similar to the male, but much larger, very thinly clothed with scales and quite opalescent; the tips of the antennæ black.

Expanse, ♂ 1¾, ♀ 2¼ inches.

Hab. West Africa, Bitje, Ja River, Cameroons, 2000 feet, dry season (*G. L. Bates, Mus. Druce*).

Allied to *Chrysopoloma subiridescens*, Holland, and *Chrysopoloma citrina*, Druce.

Fam. **Limacodidæ.**

Dalcera semirufa, sp. n.

Male.—Head, collar, tegulæ, thorax, and abdomen yellow; antennæ and legs black. Primaries red, the costal and outer margin greenish yellow: secondaries yellow, broadly bordered from the apex to the anal angle with black; the fringe yellow. Underside of both wings yellow, broadly bordered with black.

Expanse 1½ inch.

Hab. Colombia, Rio San Juan, Chaco, 150 feet (*G. M. Palmer, Mus. Druce*).

Birthama (?) *dodona*, sp. n.

Male.—Head, collar, tegulæ, thorax, abdomen, and legs chrome-yellow; antennæ and palpi black. Primaries chrome-yellow, the veins darker; a straight brown line crosses the wing from the apex to the inner margin close to the base; the fringe brownish yellow: secondaries chrome-yellow, paler than the primaries; the underside of both wings chrome-yellow, entirely without markings.

Expanse 2 inches.

Hab. West Africa, Bitje, Ja River, Cameroons, 2000 feet, wet season (*G. L. Bates, Mus. Druce*).

Fam. **Notodontidæ.**

Pheosia ockendeni, sp. n.

Male.—Head, collar, tegulæ, and thorax dark grey, mixed with white hairs; palpi black; antennæ pale brown; abdomen black, the two anal segments grey, underside of the abdomen yellowish white; legs dark grey. Primaries dark grey, shaded with reddish brown on the costal margin near the apex; a double black line crosses the wing beyond the cell from the costal to the inner margin; a second double black line crosses the wing near the base from the costal to the inner margin, the inner margin clouded with black; two reddish-brown spots edged with black at the end of the cell; the marginal line black; fringe grey: secondaries white, the costal margin from the base to the apex blackish grey, the marginal line black; the fringe white. Underside: primaries grey, reddish brown along the costal margin: secondaries white.

Expanse 2 inches.

Hab. North-east Peru, Aqualani, 10,000 feet, wet season (*G. Ockenden, Mus. Druce*).

Fam. **Noctuidæ.**

Subfam. *Acronyctinæ.*

Erocha trita, sp. n.

Male.—Head, abdomen, and legs black; collar, tegulæ, and thorax grey; the anal tuft reddish brown. Primaries grey, very thickly irrorated with black scales; a round black spot in the cell and an oval-shaped spot at the end of the cell; a zigzag rather broad white line crosses the wing near the base from the costal to the inner margin; a second zigzag line crosses the wing beyond the cell, ending in a large white spot close to the anal angle; the primaries are very similar to those of *Erocha dolens*, Druce: secondaries pale cream-yellow, the marginal line black; the fringe white. Underside similar to the upperside, the costal margin and the apex of the primaries black.

Expanse 2 inches.

Hab. S.E. Peru, Aqualani, 10,000 feet (*G. Ockenden, Mus. Druce*).

Iscadia buckleyi, sp. n.

Œdemasia (?) *alcimede*, Druce, P. Z. S. 1890, p. 510; Biologia Centr.-Am., Lep. Het. ii. p. 453.

Phastia alcimede, Schs. Trans. Ent. Soc. 1891, p. 257.

Female.—Head and palpi black above, underside of palpi pale brown; collar, tegulæ, thorax, and abdomen dark brown, underside of the abdomen pale brown. Primaries dark brown, pale brown at the base and partly across the wing; two spots in the cell; two zigzag black lines cross the wing from the costal to the inner margin, the first nearest the base, the second beyond the cell; a pale brown patch at the apex crossed with black spots; a submarginal light brown line with black points extends from apex to the anal angle; the marginal line black; the fringe dark brown: secondaries uniformly brown, the fringe slightly paler in colour. Underside of both wings brown.

Expanse 2¼ inches.

Hab. Ecuador, Sarayacu (*Buckley, Mus. Druce*).

Iscadia variegata, sp. n.

Female.—Head, collar, tegulæ, thorax, and abdomen grey irrorated with black hairs, collar edged with black; antennæ greyish brown; palpi grey, the point black; underside of the abdomen and legs greyish white. Primaries grey, heavily marked with brown along the costal margin; a waved black line crosses the middle of the wing from the costal to the inner margin; an indistinct zigzag white line crosses from near the apex to the anal angle; a marginal row of small black spots extends from the apex to the anal angle; a black spot at the end of the cell; the fringe dark grey: secondaries brownish white, deeply shaded with brown at the apex and partly round the outer margin. Underside: primaries greyish black, the inner margin white: secondaries the same as above.

Expanse 1½ inch.

Hab. Trinidad, Caparo (*S. M. Klages*); Colombia, Don Amo, 2000 feet (*H. H. Smith*); S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden, Mus. Druce*).

Alæognatha nitescens, sp. n.

Male.—Head, antennæ, collar, tegulæ, thorax, and abdomen very dark grey; the underside of the thorax, legs, and abdomen pale grey. Primaries grey, thickly irrorated with fine black scales; a black spot in the middle of the cell and one at the end of the cell; a dark grey mark near the apex, below which are several black spots; the outer margin spotted with black; the fringe grey: secondaries white, slightly edged with pale brown at the apex; the fringe white. Underside: primaries pale grey, with three black spots on the costal margin near the apex: secondaries as above.—*Female* the same as the male, but larger and more heavily marked.

Expanse, ♂ 1½, ♀ 1¾ inch.

Hab. Peru, Oconeque, Carabaya, 7000 feet (*G. Ockenden, Mus. Druce*).

Elæognatha melanosticta, sp. n.

Male.—Head, collar, tegulæ, and thorax dark grey, the third joint of the palpi black, the base of the thorax mottled with white; abdomen blackish brown, anal tuft white; underside of the abdomen and legs yellowish white. Primaries grey, the base heavily mottled with white, crossed by several black lines; a submarginal waved pale grey line extends from the apex to the anal angle; the marginal line spotted with black: secondaries greyish white, the underside of both wings pale grey.—*Female* very similar to the male, but darker in colour.

Expanse 1½ inch.

Hab. S.E. Peru, La Oroya, Rio Inambari, 3000 feet; Santo Domingo, 6000 feet (*G. Ockenden, Mus. Druce*).

Elæognatha purpurascens, sp. n.

Male.—Head, palpi, antennæ, collar, tegulæ, thorax, and abdomen greyish black, the underside of the abdomen and legs yellowish white. Primaries dark grey; a small black spot at the base, one in the cell, and one at the end of the cell; a greenish spot on the inner margin close to the base, edged with white; a reddish-brown spot near the apex, streaked with black; a marginal row of small black dots extends from the apex to the anal angle: secondaries brownish white. Underside of both wings pale brown.

Expanse 1½ inch.

Hab. S.E. Peru, Rio Inambari, 3000 feet (*G. Ockenden, Mus. Druce*).

Elæognatha cacaonis, sp. n.

Female.—Head, palpi, collar, tegulæ, thorax, and abdomen very dark blackish brown; antennæ black; legs grey. Primaries dark brown, thickly irrorated with white scales and lines; a grey mark on the costal margin close to the base, below which is a black band reaching the inner margin; several white waved lines extend from the apex to the anal angle; the marginal line spotted with black; the fringe brown: secondaries dark blackish brown, the fringe grey. Underside of both wings black.

Expanse 1¾ inch.

Hab. W. Central Trinidad, Caparo (*F. Birch, Mus. Druce*).

Fam. Ægeridæ.

Melittia rugia, sp. n.

Head, antennæ, tegulæ, thorax, and abdomen black; collar white; palpi white, tipped with black; legs black, clothed with black hairs; the terminal joint clothed with bright red hairs. Primaries bluish black, the cell hyaline, the fringe black: secondaries hyaline, the veins and fringe black, the inner margin from the base to the anal angle thickly clothed with metallic bluish-green scales. The underside similar to the upperside.

Expanse 1¾ inch.

Hab. Peru, Chanchamayo, 1000–1500 metres (*Mus. Druce*).

Ægeria belia, sp. n.

Male.—Head, collar, thorax, and abdomen bluish black, abdomen and thorax white on the underside; antennæ black; palpi black, white on the underside; legs black. Primaries black; a spot at the end of the cell; a band beyond the cell extending from the costal margin to the anal angle, and a streak from the base along the inner margin all hyaline, the band near the apex crossed by black veins: secondaries hyaline, the veins black, the fringe black.

Expanse 1⅛ inch.

Hab. W. Africa, Bitje, Ja River, Cameroons, 2000 feet, wet season (*G. L. Bates*, *Mus. Druce*).

Fam. **Pyralidæ.**

Subfam. *CHRYSAUGINÆ.*

Tamyra klagesi, sp. n.

Female.—Head, collar, tegulæ, and thorax pinkish fawn-colour, the tegulæ edged with reddish brown; palpi very long, tufted at the end, black above, fawn-colour on the underside; antennæ reddish brown; abdomen reddish brown; legs brown. Primaries: the costal half of the wing pale fawn-colour, irrorated with minute dark brown scales; the inner half of the wing and the outer margin reddish brown, darkest about the middle of the inner margin; a submarginal black waved line extends from the apex to vein 1; the fringe reddish brown: secondaries pinkish white, darkest at the apex and round the outer margin. Underside pinkish white, the apex and outer margin of both wings reddish brown; a black spot at the end of the cell of both wings.

Expanse 2¼ inches.

Hab. Trinidad, Caparo (*S. M. Klages*, *Mus. Druce*).

Allied to *Tamyra penicillana*, Herr.-Schäff.

Subfam. *EPIPASCHIINÆ.*

Macalla argentilinea, sp. n.

Male.—Head pale brown, collar and tegulæ white streaked with pale brown; antennæ brown; abdomen pale brown, spotted with black on each side; legs pale brown. Primaries pale yellowish brown, crossed from the costal to the inner margin by two silvery-white lines, the first near the base, the second at the end of the cell; the lines are edged with black on the inner side; a large oval-shaped white spot, thickly irrorated with pale brown scales on the outer margin close to the anal angle, edged with black, the marginal line black; two black streaks at the apex; the fringe silvery brown: secondaries dusky white, darkest at the apex. Underside brownish white.

Expanse 1¼ inch.

Hab. S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden*, *Mus. Druce*).

Macalla viridis, sp. n.

Male.—Head, palpi, and antennæ pale brown; collar and tegulæ pale pea-green; thorax and abdomen pale brown. Primaries pea-green, fading to yellowish brown; a silvery-brown line crossing the wing from the costal margin to the inner margin close to the base, a second about the middle of cell, which extends partly along the inner margin almost to the anal angle, then crosses the wing to the apex, curves round the end of the cell to just above vein 1; a dark oval-shaped mark at the end of the cell, edged with pale brown, the marginal line silvery brown: secondaries silky white. Underside: primaries pale pinkish brown, secondaries white.

Expanse $1\frac{4}{10}$ inch.

Hab. S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden*, *Mus. Druce*).

Macalla rufilinea, sp. n.

Male.—Head, thorax, and abdomen grey; collar and tegulæ reddish brown. Primaries grey, thickly irrorated with dark brown scales; five reddish-brown lines cross the wing beyond the cell, forming a network to the outer margin; the fringe alternately reddish brown and grey: secondaries silky white, shaded with blackish brown at the apex. Underside: primaries blackish brown, secondaries as above.—*Female* very similar to the male, but larger and more heavily marked with reddish-brown lines on the primaries; the secondaries are also blacker round the outer margin.

Expanse, ♂ $1\frac{3}{10}$, ♀ 1¼ inch.

Hab. S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden*, *Mus. Druce*).

Macalla rufibasis, sp. n.

Male.—Head, palpi, collar, tegulæ, and thorax brownish red; antennæ brown; abdomen grey. Primaries dark grey, the basal half brownish red; two waved whitish lines cross the wing from the costal to the inner margin, the first at the end of the cell, the second submarginal; a reddish-brown spot at the apex; the marginal line black; the fringe white: secondaries sordid white, the marginal line black. Underside: primaries pale brown; secondaries the same as above, with the costal margin broadly brown.

Expanse 1⅛ inch.

Hab. Peru, Rio Huacamayo, Carabaya, 3100 feet (*G. Ockenden, Mus. Druce*).

Subfam. CRAMBINÆ.

Erupa titana, sp. n.

Male.—Head, palpi, collar, tegulæ, thorax, and abdomen dark brown; underside of the abdomen and legs yellowish brown. Primaries dark glossy brown, crossed from the apex almost to the middle of the inner margin by a waved yellow line; a large yellow >-shaped mark crosses the wing about the middle from the costal to the inner margin; the point of the > is at the end of the cell; a marginal row of black spots with yellow points extends from the apex to the anal angle; the fringe dark brown: secondaries very dark brown. Underside of both wings glossy dark brown, with a pinkish tinge: primaries, a dark spot at the end of the cell, the costal and outer margin edged with yellow: secondaries, the outer margin edged with yellow and a black spot at the end of the cell.

Expanse 2¼ inches.

Hab. S.E. Peru, Santo Domingo, 6000 feet (*G. Ockenden, Mus. Druce*).

Erupa argentilinea, sp. n.

Male.—Head, palpi, antennæ, collar, tegulæ, and thorax dark reddish brown; abdomen pale yellow, almost cream-colour. Primaries reddish brown, crossed from the costal to the inner margin by three broken curved silver lines; a marginal row of small silver spots extends from the apex to the anal angle; the fringe reddish brown: secondaries cream-colour, with the outer margin slightly dusky. Underside of both wings pale reddish brown.

Expanse 1¼ inch.

Hab. West Colombia, San Antonio, 5800 feet (*M. G. Palmer, Mus. Druce*).

XVIII.—*Mammals from the River Supinaam, Demerara, presented by Mr. F. V. McConnell to the British Museum.* By OLDFIELD THOMAS.

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MR. F. V. MCCONNELL, the donor of the valuable collection from the Kanuku Mountains, of which I gave an account in 1901 *, has since presented to the National Museum a number of smaller collections from other parts of British Guiana. The latest of these is from the River Supinaam, a tributary of the Lower Essequibo, and is of sufficient importance to make a list of the species contained in it worthy of publication.

1. *Cebus apiculatus*, Spix.

Two specimens.

2. *Pithecia pithecia*, L.

One.

3. *Pithecia chiropotes*, Humb.

One.

4. *Tonatia læphotis*, sp. n.

One.

Allied to *T. sylvicola*, d'Orb., which would appear to be distinguishable from *T. amblyotis* by its larger size, and notably its larger skull. General characters as in the former species, but ears markedly larger, measuring (after damping) 30 mm. in length from the inner base by 22·5 in breadth, as compared with 25×21 in an example similarly treated of *T. sylvicola*. Feet smaller than in *sylvicola*, the distance from behind the base of the calcar to the ends of the claws 18 mm. as compared with 20–21 in *sylvicola*.

Colour quite as in *T. sylvicola*, though the grey collar hardly goes up so far on the sides of the neck.

Skull as in *T. sylvicola*, the posterior palate rather narrower.

Dimensions of the type (measured on the skin):—

Forearm 56 mm.

Ear (wet) 30×22·5; third finger, metacarpus 45, first phalanx 20, second phalanx 20; lower leg and hind foot (c. u.) 43.

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* Ann. & Mag. Nat. Hist. (7) viii. p. 139.

Skull: greatest length 28·3; condylo-basal length 24·7; zygomatic breadth 14·7; mastoid breadth 14·5; palatal length 13·3; front of canine to back of m^3 10·5. Breadth between outer corners of m^3 9·4.

Type. B.M. no. 10. 5. 4. 5.

This would appear to be the Guianan representative of *T. sylvicola*, but material is not at present available to elucidate the relative positions of the various forms described.

5. *Nasua vittata*, Tschudi.

Male and two females.

Of this rare and peculiar species I only know of two previous specimens, the type in the Berlin Museum and an example which lived in the Zoological Gardens some years ago and is now mounted in the Hon. W. Rothschild's Museum at Tring.

The male is coloured very much as described by Tschudi, but the females are blackish throughout on the upper surface and sides, though the bases of the hairs and the whole under surface are ochraceous or tawny as in the male. Whether this difference is individual or really sexual more material will be needed to decide.

6. *Lutra mitis*, Thos.

One female.

7. *Tayra barbara*, L.

One.

8. *Sciurus æstuans*, L.

Four.

9. *Nectomys squamipes melanius*, subsp. n.

Three.

Size and general characters as in true *squamipes*, the Brazilian water-rat. Colour, however, distinctly darker, the greater part of the dorsal area blackish brown, almost without lighter tickings; sides and hips dark broccoli-brown; under surface soiled greyish with buffy tips.

Skull rather smaller and molar series shorter than in *squamipes*. Palatal foramina with a tendency to a median constriction.

Dimensions of the type (measured in the flesh):—

Head and body 244 mm.; tail 200; hind foot (s. u.) 46; ear 24.

Skull: greatest length 45; basilar length 36·2; zygomatic breadth 24; nasals 17·7; interorbital breadth 7·4; palatilar length 20; palatal foramina 8·6; upper molar series 6·2.

Hab. (of type). Lower Essequibo River, 12 miles from mouth. Alt. 40 feet. Other specimens from Supinaam River and from Surinam.

Type. Adult male. B.M. no. 6. 4. 8. 32. Original number 60. Collected 10th March, 1906, by S. B. Warren. Presented by Oldfield Thomas.

This is the Guianan representative of the Brazilian water-rat, *N. squamipes*, but is distinguishable by its darker dorsal colour and smaller skull and teeth.

The Trinidad form, *N. palmipes*, is also nearly allied, but its nasals are more abruptly narrowed posteriorly.

The three specimens in the present collection are of a more rufous colour than the three obtained in 1906 by Mr. Warren, but this would appear to be merely due to bleaching.

10. *Oryzomys macconnelli*, sp. n.

Eight.

A large rich rufous species, apparently allied to *O. intermedius*.

Size comparatively large. Fur rich and sleek; hairs of back about 12 mm. in length. General colour above bright rich tawny or tawny ochraceous, darkened along the middle area of the back. Sides clearer "tawny ochraceous." Under surface sharply defined white, the basal halves of the hairs slaty. Head rather browner than back. Ears large, blackish brown. Hands and feet silvery white. Tail long, very finely scaled, short-haired, brown above, dull white below.

Skull somewhat like that of *O. intermedius*. General outline long and slender. Interorbital ridges well marked, evenly divergent, but little overhanging. Palatal foramina of medium length, slightly longer than the molar series.

Dimensions of the type (measured in skin):—

Head and body (c.) 145 mm.; tail 159; hind foot 35; ear 24.

Skull: greatest length 36·3; basilar length 27·7; zygomatic breadth 17·3; nasals 14·6; interorbital breadth 5·7; breadth of brain-case 13·7; palatilar length 16; diastema 9·8; palatal foramina 6·1; length of upper molar series 5·3.

Type. Old female. B.M. no. 10. 5. 4. 34.

This handsome species is readily distinguished from any of its allies by its rich rufous colour. It is probably a Guianan representative of the Brazilian *O. intermedius*, Leche, but is more brightly coloured.

I have named it in honour of the donor of the collection, Mr. F. V. McConnell, to whom the National Museum owes not only this but many other valuable donations.

11. *Oryzomys* sp.

Four.

O. laticeps group.

12. *Œcomys guianæ*, sp. n.

Eight.

A large species, the hairs of the belly grey-based.

General characters very much as in *Œ. marmosurus*. Size rather less than in that species, the feet noticeably shorter. Colour above between "tawny" and "clay-colour," distinctly darker and more brownish than in *Œ. marmosurus*. Under surface dull buffy whitish, the bases of the hairs, except just on the chin and throat, slaty grey, even down the centre line of the belly; laterally the line of demarcation is sharper than in *marmosurus*, less sharp than in *tapajinus*; a dull buffy line along the lower edge of the colour of the flanks. Hands and feet pale brown, the fine hairs with a silvery gloss. Tail uniform dark brown above and below, the hairy part at its base less than in *Œ. marmosurus*.

Skull and teeth as in *Œ. marmosurus*.

Dimensions of the type (measured in skin):—

Head and body 115 mm.; tail 155; hind foot 26; ear 16.

Skull: greatest length 32·7; zygomatic breadth 17·7; palatal foramina 5·7; upper molar series 4·9.

Type. Adult female. B.M. no. 10. 5. 4. 23.

The three large species of *Œcomys* from N.E. South America, *Œ. marmosurus*, *tapajinus*, and the present one, are all very similar in size and cranial characters, but are distinguishable by the colour of the under surface. In *Œ. marmosurus* this passes quite gradually into the colour of the sides, without line of demarcation, and the hairs of the middle line of chest and belly are white to their bases. In *Œ. tapajinus* all the hairs below are completely white, except just along the sides of the belly, and there is a very sharply defined lateral line of demarcation. In *Œ. guianæ* all the hairs below are slate-based and the lateral line is of an intermediate degree of definition.

In the above characters the eight specimens are quite uniform *inter se*, the only variation being in the general body-colour, which varies considerably, though never so rich a rufous as in *Œ. tapajinus* or so pale as in *Œ. marmosurus*.

13. *Neacomys guianæ*, Thos.

One.

14. *Loncheres chrysurus*, Zimm.

One.

It is unfortunate that the unsuitable name *chrysurus*, based on the "Lerot à queue dorée" of Buffon, should antedate the better known *cristatus*, but there can be no doubt as to its technical applicability to this animal.

The only previous examples of this rare animal that the Museum has received are one from Sir R. Schomburgk and one from Dr. Bovallius. An example of the nearly allied but smaller *L. paleacea*, Illiger, of Para, has also been received from the Para Museum.

15. *Proechimys cayennensis*, Desm.

Five.

16. *Dasyprocta rubrata*, Thos.

Three young.

17. *Bradypus tridactylus*, L.

One.

18. *Cholæpus didactylus*, L.

Two.

19. *Tamandua tetradactyla*, L.

Three.

20. *Cyclopes didactylus*, L.

One.

21. *Didelphis marsupialis*, L.

Two.

22. *Metachirus opossum*, L.

One.

23. *Metachirus nudicaudatus*, Geoff.

One.

24. *Caluromys philander*, L.

One.

More or less intermediate between *C. philander* and *C. trinitatis*, whose relations to each other are at present difficult to make out, owing to the puzzling amount of variability in the size of their skulls.

25. *Marmosa chloe*, Thos.

Three.

XIX.—*Descriptions of new Heterocera from Costa Rica.* By W. Schaus, F.Z.S.

Syntomidæ.

Dasysphinx volatilis, sp. n.

Body black; two large white spots on collar; paired white spots dorsally on abdomen, and a sublateral row of white spots. Legs with a white spot at joint of tibia and tarsi, the latter streaked with white. Wings hyaline; veins and fringe black. Fore wings: broad terminal whitish streaks between the veins; basal half tinged with reddish orange, darkest on costa, inner margin, and base above submedian; the discocellular inwardly shaded with black. Hind wings: a black point at angle of discocellular; the inner margin broadly black.

Expanse 40 mm.

Hab. Volcano Poas; June.

Episcepsis vinasia, sp. n.

Palpi and legs fuscous black streaked with grey. Frons blackish grey; head posteriorly ochreous. Collar and thorax fuscous black, the former edged in front with ochreous, and with a sublateral ochreous spot. Abdomen metallic blue above, with dorsal fuscous-black hairs; underneath white; fore coxæ ochreous. Primaries fuscous black, the veins greyish. Secondaries deep bluish black; a broad white streak from base in and below cell; a white streak along inner margin in male partly concealed by buff tufts.

Expanse 32 mm.

Hab. Juan Vinas, Sixola River.

Episcepsis gnomoides, sp. n.

♂. Palpi black, white on first segment. Head black; two white points in front; two red spots behind. Legs fuscous black; fore coxæ white. Collar and thorax fuscous black; a red spot below tegula. Abdomen blue above with basal subdorsal black tufts; underneath ventral white spots on first three segments. Fore wings dark violaceous brown, the veins, a streak in cell, and one in submedian interspace black. Hind wings deep black; a slightly hyaline streak in cell, below it and just beyond it.

Expanse 31 mm.

Hab. Sixola River.

Allied to *E. gnoma*, Butler, but the veins black instead of being pale.

Episcepsis redunda, sp. n.

Body fuscous brown; two crimson spots on back of head, and a red spot laterally below tegula; fore coxæ crimson. Abdomen brilliant blue dorsally on last segments; underneath with ventral white patches. Primaries fuscous brown, concolorous. Secondaries fuscous black, whitish hyaline below cell and slightly within it, also near cell between veins 2 and 4; underneath with a broad white streak from base to near outer margin.

Expanse 33 mm.

Hab. Banana River, Sixola, Tuis.

Also in Nat. Mus., Washington, from Trinidad, Peru, French and British Guiana, Aroa, Venezuela, Santa Rosa, Jalapa, Mexico.

Episcepsis sixola, sp. n.

Palpi and legs brown-black. Palpi with a white spot on first segment. White spots at base and end of coxæ; fore coxæ streaked with white in male, with roseate in female. Collar and thorax brown-black, the former with dorsal and lateral red spots. Abdomen dull blue-black, underneath with two rows of white spots. Primaries brown-black, the veins still darker; a vague subterminal broad darker shade. Secondaries black; a short white streak in cell, and a large white patch at base of inner margin; some white scales beyond cell between veins 2 and 5.

Expanse, ♂ 34, ♀ 37 mm.

Hab. ♂, Sixola River; ♀, Juan Vinas.

Episcepsis oapysca, sp. n.

♀. Legs and palpi dark grey streaked with white; fore coxæ with white streak. Head ochreous spotted with black; the frons blackish with a few white scales. Collar brown-black, with some ochreous shading in front and laterally. Thorax brownish black; a grey line on patagia. Abdomen blue-black; a ventral row of white spots. Primaries dark olive-brown; the veins and a streak in cell and one below it grey; the apex broadly snowy-white. Secondaries bluish black; a semihyaline streak below cell, slightly in it, and also beyond it shortly.

Expanse 36 mm.

Hab. Tuis, Costa Rica.

Bears a strong resemblance to *Patreliura capys*, Cr.

Aclytia albistriga, sp. n.

Head and thorax black; white streaks on frons and patagia; the first joint of palpi, spots on head behind, and tegulæ outwardly ochreous. Abdomen blue above, white underneath. Coxæ white. Legs fuscous streaked with white. Fore wings black; the base of subcostal and submedian veins tinged with grey; some light blue scales at base of inner margin; an oblique white streak across discocellular from subcostal vein to near tornus. Hind wings blue-black; a broad hyaline streak below cell; a short streak in end of cell, and a patch between veins 2 and 3; a short streak at base of inner margin.

Expanse 31 mm.

Hab. Guapiles.

Agyrta vitrea, sp. n.

Palpi black streaked with white; the first joint and neck crimson. Frons black with lateral white streaks; back of head red and black. Thorax and abdomen above dark blue with subdorsal white streak; a lateral black line; venter and coxæ white. Legs fuscous streaked with white. Fore wings black shot with dark blue; a light blue basal streak above submedian; a portion of cell, a space between veins 2 and 3, and a broad streak below cell and vein 2 to near outer margin hyaline; a postmedial band from vein 8 to vein 3 near termen, white, semihyaline. Hind wings hyaline; the veins and margins broadly black shot with blue, brightest on costal margin and at tornus. Fringe white at apex and tornus.

Expanse 39 mm.

Hab. Guapiles.

Eucereon consorta, sp. n.

Palpi black, the tips of each joint with a white spot. Head white. Collar black, with a large creamy spot on each tegula. Thorax white; a black spot posteriorly; a black spot on patagia in front. Abdomen dorsally orange with a large black patch extending on next to last segment, anal segment black; sublateral row of black spots; underneath white, the last two segments black. Legs black, with white rings at joints; fore coxæ black, other coxæ white. Primaries creamy-white; five irregular black patches on costal margin; the first extending to inner margin and enclosing a small white spot at base; the second reaching the median vein, on which are two black points preceding and following this spot; the third crossing cell, and extending between veins 3–5; the fourth reaching vein 5; the fifth much smaller, nearly touching vein 7; an irregular black space on inner margin from base to middle, followed by a small spot surmounted by a black point, an irregular large black mark at tornus; some black terminal spots. Secondaries fuscous, slightly hyaline on more than basal half and towards tornus.

Expanse 40 mm.

Hab. Juan Vinas, Tuis, and other localities.

Eucereon xanthura, sp. n.

♂. Palpi fuscous. Head black; two orange spots posteriorly. Collar dark grey. Thorax white streaked with grey. Abdomen above black, the dorsal basal hairs tinged with brown; the last segment orange above; underneath with two white bands crossed by black lines; the last two segments below black. Legs grey, streaked with white. Fore wings whitish tinged with pale ochreous at base; the veins black; an antemedial black line angled outwards in cell and submedian interspace, and inwards on median nervure; a postmedial shade from vein 4 to middle of inner margin; a strongly dentate irregular subterminal line, broadest near apex and tornus; an apical black spot, another terminally at vein 2; diffuse black shades on costa at origin of lines; the veins slightly thickened when crossed by lines. Secondaries whitish, the outer margin fuscous.

Expanse 36 mm.

Hab. Tuis, Juan Vinas.

In Nat. Mus., Washington, from Mexico, Venezuela, and Petropolis, Brazil.

Allied to *E. leucophæum*, Wlk., but differs in markings of head and thorax.

Eucereon decorum, sp. n.

Body fuscous; broad white streaks on thorax and patagia; first segment of palpi, a spot under eyes laterally, the back of head, a spot at origin of costa and the two terminal segments orange; two rows of white ventral spots becoming sublateral towards last segment; legs streaked with grey. Fore wings light brown to postmedial line, then whitish; the veins and a streak from near base of median vein to upper angle of cell, and one below submedian, black; the antemedial fuscous line angled in cell; the postmedial forming two curves outwardly from costa to vein 3, then incurved to middle of inner margin; a thick fuscous subterminal and irregular shade; veins 6, 7, and 8 terminally more broadly black. Hind wings fuscous, the discal area whitish, less so in the female.

Expanse, ♂ 42, ♀ 49 mm.

Hab. Tuis, Juan Vinas, Guapiles.

Eucereon cimonis, sp. n.

Palpi fuscous, the first joint yellowish. Head dark grey; paired yellow spots on frons and vertex, and the same colour below eyes, and a similar lateral streak below tegula. Thorax olive-brown streaked with black; two greyish tufts posteriorly. Abdomen above crimson, except black terminal segment, and a large dorsal black tuft on first three segments, then subdorsal black points on other segments; a broad black lateral band; venter, except last segments and coxæ, salmon-pink; legs fuscous grey shaded with white. Fore wings roseate grey; the veins and a streak in cell light olive-brown; the markings black; four small spots on costa; three paired spots in cell, the antemedial very small, the medial large, the others at end of cell more widely apart; two large spots close beyond discocellular followed by two smaller spots; an oblique broad mark at base of inner margin, followed by a streak; a streak and two small spots below median, below this a long streak, and three spots between this and submedian, the last surmounted by a spot above the long streak, and with one below it on inner margin coalescing with the basal streak; a large round spot between 2 and 3, and smaller ones between 3 and 5; an outer row of elongated spots between all the veins, broken between veins 3 and 5 into a pair and transverse streak; a marginal row of large oval spots, and terminal spots on veins. Hind wings fuscous hyaline, the veins and outer margin broadly darker.

Expanse 43 mm.

Hab. Tuis, Juan Vinas.

Also in Nat. Mus. from Aroa, Venezuela, and Paramba, Ecuador.

Eucereon tessellatum, sp. n.

♀. Palpi fuscous, with grey spots on first and end of second segment. Head dark grey; a black spot between antennæ; neck, a lateral streak below tegulæ and two spots on head behind, salmon-pink. Thorax dark grey streaked with black. Abdomen above crimson; a basal patch followed by black points, a lateral band and terminal segment black; venter and coxæ salmon-pink. Legs fuscous streaked with grey. Fore wings lilacine grey, the veins concolorous; the spots black; some basal spots and streaks; an antemedial row of spots followed by an elongated pair in cell; four medial spots below cell, the smallest between 2 and 3; two spots at end of cell, followed by large spots, the one on costa elongated, a small one below it, a large one between 5 and 6; two elongated between 3 and 5, and a large one between 2 and 3; an outer row of small spots, the one between veins 2 and 3 much larger, then incurved and elongated to inner margin; large elongated subterminal spots from vein 5 to costa; a row of large oval marginal spots, and terminal black spots on veins. Hind wings fuscous hyaline, the veins and outer margin broadly darker.

Expanse 38 mm.

Hab. Juan Vinas.

This species resembles *E. æolum*, Hmps., but is much larger.

Eucereon zephyrum, sp. n.

Legs and palpi grey streaked with white. Head grey; a streak between and basal joint of antennæ white; back of head and neck yellow. Thorax white streaked with grey. Abdomen above yellow, next to last segment and a subdorsal streak grey; underneath grey; two bands and anal segment white. Primaries white; the veins, transverse lines and a streak in cell, and submedian interspace grey; the antemedial dentate; the postmedial wavy, incurved below vein 3 to middle of inner margin; from vein 3 to tornus some heavier grey markings; discocellular also more heavily marked; beyond the postmedial a conspicuous white space from costa to tornus has the veins also white; a subterminal broad grey shade from vein 5 to costa; the marginal area suffused with grey above vein 3. Hind wings white, semihyaline, iridescent; the apex and outer margin narrowly suffused with fuscous.

Expanse 32 mm.

Hab. Juan Vinas.

Eucereon venosa, sp. n.

Body fuscous; frons whitish; two orange spots on head behind; an orange lateral streak below tegulæ; an orange streak on patagia; basal half of venter white; white streaks on legs. Fore wings whitish; the veins and streak in cell and submedian interspace broadly grey, except on a large round white spot beyond the cell; basal half of costal margin and inner margin tinged with orange; a large darker grey suffusion at end of cell and beyond the white spot, this narrowing and forming an indistinct subterminal line. Secondaries whitish fuscous at base becoming darker on outer margin.

Expanse 23 mm.

Hab. Juan Vinas.

Eucereon tenellulum, sp. n.

♀. Palpi, head, collar, and thorax fuscous grey. Legs fuscous grey streaked with white; two ochreous spots on head; an ochreous streak on patagia. Abdomen fuscous black; the subdorsal basal tufts light brown; the anus ochreous; the first three segments of venter white. Fore wings greyish; antemedial pale ochreous streaks on costal and subcostal veins, and two in cell separated by a long blackish streak, also below median at base, at end of median and commencement of veins 3, 4, and 5, longer streaks above and below submedian; a medial darker shade from costa into cell; a broad postmedial shade, irregular, cut by veins and blackish below vein 2, this followed by a whitish shade broadest at costa to vein 5; a subterminal dark shade widest at costa and at tornus; the outer margin whitish with large terminal dark spots, except veins 2 and 3. Hind wings whitish, the outer margin broadly fuscous.

Expanse 33 mm.

Hab. Juan Vinas.

Hyaleucerea morosa, sp. n.

♀. Body dull greyish black; the abdomen dorsally on terminal half deep blue-black; head behind and a spot laterally below eye dark red. Fore wings greyish black, the veins, a streak in cell and one below cell black; a large medial black shade from cell to inner margin; a subterminal black shade, broadest at tornus and between veins 5 and 6; a small spot at base of inner margin tinged with dark blue. Hind wings blue-black; a faint hyaline streak in and below cell.

Expanse 43 mm.

Hab. Juan Vinas.

Hyaleucerea sororia, sp. n.

Body black; a lateral white streak on frons and below eyes; two orange spots on head behind; an orange streak on patagia; anal segments orange; first three segments of venter white; legs streaked with white. Fore wings black, an ochreous streak on basal half of costa and along inner margin; two whitish streaks in cell; two streaks below cell, the lower one basally ochreous; intervenal streaks on outer part of wing below vein 5, whitish, partly shaded with ochreous; a large black space on costa and about end of cell, with diffuse blackish shade to middle of inner margin; a white spot between veins 5 and 8; the apex blackish with a faint ochreous streak on costa; a small terminal white shade between veins 5 and 6. Hind wings fuscous white, the veins and outer margin black.

Expanse 27 mm.

Hab. Juan Vinas.

Allied to *H. costinotata*, Dogn.

Arctiidæ.

Idalus pauperis, sp. n.

♂. Body ochraceous. Palpi, legs, and fore coxæ slaty black; last three segments of abdomen above black; a row of black sublateral spots.

The female has the last six segments of abdomen above black and a broad lateral black band from base; underneath only the last two segments are black in both sexes. Primaries ochraceous. Secondaries more yellow in tint.

Expanse, ♂ 31, ♀ 39 mm.

Hab. Tuis, Juan Vinas.

Phæomolis mera, sp. n.

♂. Palpi grey, with white spots on first and second segments. Antennæ grey. Head yellow, some grey on frons.

Collar and thorax grey streaked with white. Abdomen above dark grey, with a white subdorsal line; the last three segments yellow; anus grey; underneath white, the legs streaked with grey. Primaries light grey with darker grey intervenal streaks and veins; two large white semihyaline postmedial spots between veins 3 and 5; terminal white spots on veins. Secondaries grey streaked with dark grey; the costal margin whitish with a reddish-brown spot of androconia.

Expanse 46 mm.

Hab. Tuis.

Prumala tessellata, sp. n.

♂. Palpi dark brown. Head pale green. Collar and patagia pale green, subdorsally dark brown. Abdomen yellowish, with a large blackish dorsal space extending laterally at base; black transverse lines on yellow portion, especially on last segment. Legs dark grey; fore coxæ orange with a black spot. Primaries pale green with large dark brown spots, one at base not reaching inner margin; antemedial spots from costa to submedian, below which is a short streak; a large spot above discocellular containing a green point; two dark dots close to cell between veins 3 and 5; a broad postmedial band of irregular spots coalescing, except at veins 2 and 4; a small apical spot; a marginal row of small narrow elliptical spots. Secondaries pale buff; black hairs at base and along inner margin; a quadrate blackish spot at end of cell; a large dark spot below apex on outer margin, and a still larger one near anal angle.

Expanse 41 mm.

Hab. Cartago, El Sitio.

Prumala herbosa, sp. n.

♂. Palpi and tarsi brown. Legs light green. Body light green, the abdomen dorsally red; some brown and red around eyes; fore coxæ partly brown; patagia subdorsally edged with brown. Primaries light green with brownish markings; a small medial spot in cell; the discocellular finely, and a spot above it; a larger antemedial spot crossing cell and contiguous to a large circular mark below cell, which has its edges irregular and extends along vein 2 and submedian to a postmedial irregular band from costa to inner angle; this band is crossed by short darker dashes on veins; a marginal row of small intervenal spots. Secondaries whitish tinged with green; the inner margin roseate; a large brownish spot at anal angle, and a small spot near apex. Some males have the markings much less developed, the fore coxæ, patagia, and discocellular green; the postmedial band reduced to a line.

The female has a spot and a point in cell; sometimes a spot below cell; the postmedial consisting of a row of spots or points, more conspicuous at inner angle and between veins 5 and 6.

Expanse, ♂ 42–44, ♀ 48 mm.

Hab. Juan Vinas and El Sitio.

Prumala muscosa, sp. n.

Head green, edged with black posteriorly; underneath and palpi black. Tegulæ and thorax green, the tegulæ and patagia dorsally edged with black. Abdomen black above, yellowish buff below; a lateral row of small black spots; anal hairs and basal segments buff above. Legs blackish, partly streaked with grey. Primaries light green, markings black; some spots at base; black medial spot in cell and on costa; an inwardly curved series of elongated spots from end of cell to inner margin near base; a postmedial row of sagittate spots; marginal quadrate spots between the veins. Secondaries black, thinly scaled on costal half, and tinged with yellowish buff, especially at tips of veins 2, 3, 5, and 6.

Expanse 32 mm.

Hab. Tuis.

Evius cochenouri, sp. n.

Palpi crimson, fringed in front with dark grey. Head and thorax yellow; some dark grey and crimson laterally. Abdomen crimson above. Body underneath white; fore coxæ crimson; fore legs streaked with crimson. Primaries dark fuscous grey, irrorated with crimson; the outer margin and apex broadly yellow, the two colours separated by a slightly irregular, inwardly curved, crimson line; the costa finely white to beyond middle, with a darker grey streak below it, and a crimson streak on subcostal vein; a crimson spot at base of inner margin; costa crimson towards apex; a subterminal grey spot between veins 5 and 6. Secondaries yellowish white suffused with crimson.

The female has the crimson line dividing the colours more deeply incurved at cell, and there is a second grey spot subterminally below vein 5.

Expanse, ♂ 37, ♀ 44 mm.

Hab. Juan Vinas, El Sitio.

This species has veins 3 and 5 on secondaries coincident. It is named after Mr. Cochenour, of Juan Vinas, at whose house I took my first specimen.

Automolis atænia, sp. n.

♂. Palpi yellow on first segment, otherwise black. Head orange; a bluish-black spot on frons and vertex. Tegulæ orange, outwardly black, and with a broad subdorsal black streak. Thorax black shaded with dark blue; patagia dorsally orange, outwardly black. Abdomen black; subdorsal blue spots; lateral and sublateral blue spots, and sometimes there is a row of small yellow lateral spots and the basal yellow tufts are placed more dorsally; venter with transverse orange bands on basal half. Legs black; tibiæ streaked with grey. Primaries black; costa from base to beyond middle finely orange; a deep yellow streak from near base of inner margin to outer margin between veins 5 and 6. Secondaries: the costal half deep yellow to near apex; the posterior portion black.

Expanse 36 mm.

Hab. Juan Vinas, Tuis.

Two specimens have the palpi fringed with yellow, and the fringe on the outer margin of primaries is also yellow, but I do not consider them distinct. This species is figured in the 'Novitates' for 1909, pl. vi. fig. 36, as *Automolis collateralis*, Hamps., which is quite another species.

Automolis maura, sp. n.

♂. Palpi black. Frons black, shaded with metallic blue. Vertex orange, with a blue and black spot. Collar orange, with a large black central spot. Thorax black shot with blue; patagia orange, outwardly black. Abdomen black; blue subdorsal spots on last three segments; blue hairs on anus; lateral and sublateral blue spots; ventral transverse blue streaks on first two segments. Legs black; fore coxæ blue; blue streaks on tibiæ. Wings black. Primaries: an orange streak on basal half of costa; an orange band from near base of inner margin to near termen between veins 6 and 7, where it expands slightly, its front margin somewhat uneven; fringe grey-black. Secondaries: the costa broadly orange; underneath the base of secondaries is either black or with one or two black streaks. Some males have small paired orange spots ventrally on second and third segments. The females all seem to have the orange ventral spots and also a lateral small orange spot near the base.

Expanse, ♂ 39, ♀ 44 mm.

Hab. Sitio, Juan Vinas.

Allied to *A. pratti*, Druce, but the band on primaries much narrower.

Automolis guapisa, sp. n.

Palpi black, the joints tipped with orange. Frons blue. Vertex orange, with a large black and blue spot. Thorax black. Tegulæ and patagia orange outwardly edged with black, and a subdorsal black spot on tegulæ. Legs black partly streaked with orange; tarsi orange. Abdomen black, with subdorsal blue spots posteriorly; blue lateral and sublateral spots with two paired orange spots near base, the first two lateral and sublateral sometimes coalescing; broad orange ventral spots on basal half of abdomen. Primaries dark purplish brown; the veins yellow; a fuscous streak in cell, and one below vein 2; an orange streak on base of costal margin; an orange streak from near base of inner margin tapering to beyond cell, interrupted and followed by an orange spot between veins 5 and 6; this streak is entire in one specimen. Secondaries black; a broad orange costal fascia not reaching apex.

Expanse 44 mm.

Hab. Guapiles.

Automolis tuisana, sp. n.

♂. Antennæ pectinated. Palpi white, with some grey in front; tips black and grey; laterally black. Some black around eyes and across frons. Vertex white; some pale ochreous hairs. Thorax white shaded with ochreous; two black subdorsal spots posteriorly. Legs white; the fore and hind tibiæ streaked with black. Abdomen crimson above; a row of small white subdorsal spots; anus and underneath pure white. Primaries: the basal half from costa to vein 3, and below this more extensively to near inner angle, light brown, with intervenal and discal black streaks; some white at base of inner margin; outer portion of wing white, thinly scaled; the costa finely brown; a black spot between veins 5 and 6. Secondaries white shaded with roseate, especially on inner area.

Expanse 43 mm.

Hab. Tuis.

Automolis aletis, sp. n.

Palpi white below, black above. Head white, tinged with yellow on vertex. Collar white, tinged with yellow. Thorax white; small black paired spots in front and behind, the front pair with a yellowish spot anteriorly; patagia tinged with yellow and roseate. Abdomen white, dorsally crimson except at base and terminal segment; small white subbasal spots. Legs white, partly streaked with black; fore coxæ tinged with yellow. Primaries white; the costa finely black, and blackish streaks postmedially; two antemedial black spots below cell; two black streaks at end of cell, followed by black spots between the veins close to cell; two long medial black streaks below vein 2, and one below submedian; a subterminal black streak between veins 5 and 6. Secondaries white; the inner margin broadly roseate.

Expanse 38 mm.

Hab. Sixola River.

Near *Aut. aleteria*, Schs.

Automolis vinasia, sp. n.

Palpi, head, and collar white and grey. Thorax pale yellow; patagia dark lilacine grey, with two white spots. Abdomen above crimson; anal segment and underneath white. Legs white. Primaries deep lilacine grey to beyond cell, darkest along costal and inner margin and to outer margin below vein 3; a short yellow streak in cell; a whitish dot and streak at base; white fringe on inner margin and a white streak below cell; an oblique row of deeply lunular small whitish marks from below vein 4 to inner margin towards base; a white streak on costa beyond middle; apex and outer margin above vein 3 yellow; a small yellow terminal streak below vein 3; vein 4 dark grey, the veins above this ochreous. Secondaries dark lilacine grey; cell and costal margin yellowish white: below yellowish white suffused with dark yellow at base; a dark grey streak along costa and on inner margin; a round dark spot at end of cell.

Expanse 33 mm.

Hab. Juan Vinas.

Automolis taniala, sp. n.

Palpi black. Head black; metallic-blue spots on frons and vertex; orange at base of antennæ and two orange spots behind. Collar orange, black subdorsally and laterally. Thorax black, shaded with metallic-blue posteriorly; patagia orange edged with black. Abdomen black above; metallic-blue subdorsal spots on last three segments; blue anal tufts; lateral and sublateral blue spots; paired orange spots ventrally on first two segments. Legs black; fore coxæ blue. Primaries orange; front of costa finely black; some black at base; outer margin from middle of inner margin broadly black, shading to greyish black on fringe. Secondaries black, the costal margin broadly orange. Underneath, the costa of secondaries is more broadly orange and there is an orange streak along inner margin, also a fine black subcostal streak, or the base of the costa is black as in the female.

Expanse, ♂ 33, ♀ 42 mm.

Hab. Juan Vinas, Tuis.

Allied to *A. latania*, Dr.

Automolis excavata, sp. n.

♀. Body and legs light roseate brown. Abdomen above more deeply tinged with roseate; underneath whitish. Primaries light brown, slightly excavated between apex and vein 5, more deeply below vein 5; a white spot near base above submedian vein; an antemedial and a medial row of spots below cell, indistinct, faintly yellowish, edged with red; a similar spot at end of cell; two large hyaline subterminal spots above and below vein 4; terminal lunular yellowish spots between veins 2 and 5; a terminal whitish spot between 6 and 7, and a faint terminal yellowish spot above and below it.

Expanse 55 mm.

Hab. Tuis.

Melese monima, sp. n.

♂. Palpi, head, and thorax red; the patagia edged with greyish brown. Abdomen reddish above, tinged with ochreous below. Legs streaked with grey. Primaries ochreous red irrorated with black, chiefly along costa, at end of cell, and on outer margin below vein 4; a small white semihyaline spot just beyond cell between veins 5 and 6; a small spot in cell and three rows of larger irregular spots below cell, ochreous edged with red. Secondaries creamy, semitransparent, very faintly tinged with roseate on inner margin.

Female with a large spot beyond cell reaching costal vein; the apex darker. Secondaries semihyaline rose-colour.

Expanse, ♂ 36, ♀ 42 mm.

Hab. Juan Vinas.

Bertholdia crocea, sp. n.

Palpi white, with lateral brown spots. Legs brown and white; tarsi white. Head and thorax violaceous brown; the tegulæ edged with white. Abdomen red above, white below; anal hairs white; a lateral row of black spots. Pectus white. Primaries saffron-brown, paler along inner margin and about angle; a white spot on submedian vein at one-third from base; the hyaline patch with black points on veins; the outer margin dark brown from angle to vein 3, then paler and mottled with grey, preceded above vein 4 by a whitish shade and between veins 5 and 7 by darker brown. Secondaries white, the inner margin suffused with roseate. Underneath, primaries white, a roseate patch in cell; outer margin dull brown above vein 3. Secondaries: a single dark streak at base of costa and crimson hairs at base of both wings.

Expanse, ♂ 41, ♀ 47 mm.

Hab. Juan Vinas, Tuis.

This species is Ab. I. of *B. myosticta*, Hamps. Typical *myosticta* has a geminate black streak at base of secondaries below, a character I have not found in any other species of the genus.

Bertholdia fumida, sp. n.

Altogether darker than *B. crocea*, Schs., the female especially being a dark smoky grey and having a black subdorsal spot on the last segment of the abdomen. The primaries below are entirely dark smoky grey, with only a trace of whitish above the inner angle in the male. Secondaries white, with very little crimson at base of inner margin, which is broadly suffused with smoky black, which in the female extends around the outer margin. The female with a dark point at end of cell.

Expanse, ♂ 42, ♀ 47 mm.

Hab. Juan Vinas, Tuis.

Noctuidæ.

Elæognatha troctopera, sp. n.

Palpi grey irrorated with brown; a dark brown lateral streak on second segment. Head and thorax brown. Abdomen dark grey above, whitish grey underneath. Primaries silvery grey shaded with brown; an indistinct wavy antemedial brown shade, outwardly slightly oblique from costa; a large dark brown median shade on costa extending to just below cell and containing a black streak above cell and one in it, the latter interrupted by a small paler brown spot; discocellular vein buff edged with white; an irregular dark wavy brown postmedial line, somewhat angled beyond cell and much broken below it, shaded on either side with buff; a subterminal wavy white shade forming a large lunule between veins 5 and 2, and below vein 2 perpendicular to angle; blackish terminal spots between the veins; fringe brownish buff. Underneath with a long streak of androconia in cell; the subcostal with a long fringe of hairs. Secondaries dark brown, the costal and inner margins brownish grey; the outer margin excavated below angle.

Expanse 38 mm.

Hab. Carillo; January.

Elæognatha argentea, sp. n.

Head, thorax, and legs light grey, irrorated thinly with dark scales; hind tarsi and second joint of palpi streaked with dark brown. Abdomen brownish grey. Primaries light grey, strongly shot with silver from base to postmedial line, which is fine, irregular, incurved, and dentate below cell to middle of inner margin; a broad whiter shade from base of costa to postmedial line below cell; a small, round, velvety brown spot circled with buff in cell, and a silvery-white spot on discocellular; faint brownish medial and apical shades on costa; an irregular subterminal whitish shade; terminal dark spots, largest at inner angle. Underneath with a streak of androconia in cell. Secondaries brownish grey, somewhat metallic; fringe white.

Expanse 46 mm.

Hab. Juan Vinas; Feb., June.

Lophosema purpurascens, sp. n.

Legs and palpi buff. Head, collar, and thorax grey; the collar laterally brown, separated from the grey by a dark line; patagia inwardly shaded with brown. Abdomen greyish brown. Primaries violaceous brown, with numerous fine dark grey striæ; a little grey and buff at base; the base of inner margin finely black, followed by a grey shade, medially edged above by a short black line; the orbicular and reniform consisting of fine geminate circles of a paler tinge, the latter containing a blackish spot, and below is another small black spot on vein 2; the postmedial very indistinct, oblique from costa, deeply dentate beyond cell and below vein 2, followed by two dark brown streaks beyond cell; a faint, subterminal, irregular, whitish line, and a terminal dark brown line inwardly edged by a whitish line. Secondaries somewhat hyaline at base, shading to dark brownish grey outwardly; the veins dark grey; some dark brown and whitish scales at anal angle.

Expanse 43 mm.

Hab. Juan Vinas; June.

Casandria leucopis, sp. n.

Head and thorax whitish grey, with scattered black scales and some paler reddish-brown shadings. Abdomen greyish, with subdorsal reddish-brown shades and black irrorations, chiefly ventrally. Primaries grey irrorated with black; faint subbasal and antemedial black lines; reniform round, whitish, circled finely with black; a postmedial paler brownish line, separated from veins 4–8 by a fine, nearly straight, black line; a subterminal row of smoky black cuneiform spots, partly shaded with white; the outer margin shaded with pale reddish brown; a terminal black line. Secondaries white, somewhat hyaline; the outer margin finely blackish grey, extending a little above the veins.

Expanse 24–28 mm.

Hab. Abangarez Mines; July.

Casandria chlorotica, sp. n.

Body brownish buff, slightly irrorated with black; a transverse blackish line on collar anteriorly. Primaries light brown; a fine black line at base of subcostal, forming a long curve in cell, then wavy to inner margin, resting on this on costa is an annular black line containing a dark point; a large, annular, fine black line at end of cell, within which is the reniform, indistinct, whitish, with a reddish-brown spot beyond it but within the circle; a fine smoky shade beyond the cell and dentate to middle of inner margin, closely followed by the postmedial line, which is fine, black, lunular; this is followed by an indistinct reddish-brown shade; a submarginal geminate row of blackish spots, the inner row rather larger and sagittate; a terminal row of small black spots; four postmedial black points on costa. Secondaries greyish white, the outer margin broadly smoky black; the veins dark; the fringe pale buff.

Expanse 34 mm.

Hab. Juan Vinas; Feb., May. Poas; May.

Casandria arcuata, sp. n.

♂. Costa of primaries much arched. Body brown; a pair of black spots dorsally on segment before last. Primaries silky brown, the lines darker, very indistinct; the antemedial wavy; the medial curved around cell to middle of inner margin; the postmedial dentate to inner margin near angle; indistinct subterminal spots and fine terminal black points between the veins; a black point at end of cell.

Secondaries silky brown, palest at base; a smoky black streak on discocellular.

Expanse 27 mm.

Hab. Guapiles; November.

Hypsidæ.

Hyalurga sixola, sp. n.

Palpi, head, and collar black spotted with white. Thorax white with a central black line; patagia streaked with ochreous. Abdomen above with the first and last segments white, otherwise ochreous with a dorsal black streak shaded with white on either side, and a broader black lateral streak; below greyish with transverse white lines; the legs greyish, partly streaked with ochreous and black; tarsi black. Wings whitish semihyaline. Primaries: the veins black; costal, outer margin, and outer half of inner margin narrowly ochreous; the costa finely black and shaded with black along subcostal vein; a black streak from base along submedian, curving at tornus to discocellular, which is also black; some white on basal half of inner margin, and a terminal fine white shade; fringe black and grey; below the margins are black with an ochreous streak on costa from base to near middle, and some ochreous at tornus. Secondaries white, the fringe black.

Expanse, ♂, 44 mm.

Hab. Sixola River, March and September. In B. M. from Mexico.

This species in the 'Biologia' is referred to as *H. uria*, Btl.

Hyalurga urioides, sp. n.

Palpi black streaked with white. Head and tegulæ black spotted with white. Thorax whitish with a central black line; patagia ochreous, dorsally shaded with black. Abdo- above dark grey, with a dorsal black line; laterally and below white with a ventral black band. Legs white streaked with black. Wings white, semihyaline. Primaries: the margins ochreous, edged inwardly and outwardly with black; veins black; a black spot at end of cell, which is also reached by a curved black line from tornus; below the margins are black with an ochreous streak at base and some ochreous at tornus. Secondaries: the outer margin black, containing an orange streak from anal angle to vein 4.

Expanse, ♂, 50 mm.

Hab. Tuis, Sixola, Juan Vinas.

Likewise referred to *H. uria*, Btl., in the 'Biologia.'

Centronia drucei, sp. n.

Palpi and legs black streaked with white. Frons and vertex metallic blue; white spots around eyes. Tegulæ metallic blue edged with dark brown. Thorax blue streaked with brown; patagia dark brown. Abdomen metallic blue above, crimson underneath, banded with black and white. Primaries dark brown; a broad white band from middle of costa to tornus, where it is slightly narrower than on costa and preceded by a crimson spot on costa, and one partly below it at tornus; fringe whitish at apex and at tornus. Secondaries deep blue-black, shot with metallic blue at base, broadly along median vein and narrowly along inner margin; a large red spot on costal margin just beyond middle; a white spot beyond cell between veins 5 and 6, a smaller one below it and a few whitish scales below this; fringe white except from veins 3–6, where it is black. Below the wings are black shot with brilliant light metallic blue at base of primaries and on basal half of secondaries; the white more conspicuous at apices, and on secondaries the white spots are more numerous, forming a curved series towards the inner angle.

Expanse, ♂, 63 mm.

Hab. El Sitio, Juan Vinas, Tuis, Tres Rios.

This is the species figured in the 'Biologia' as *Eucycane excellens*, Walk.

Centronia reedia, sp. n.

Legs and palpi black streaked with white. Head and thorax metallic blue; some white spots around eyes; patagia edged with dark brown. Abdomen blue above, crimson below banded with black, edged with a few whitish scales. Primaries brown-black above; a broad white band from just beyond middle of costa to tornus, widening beyond cell and then narrowing to tornus, preceded by a red spot on costa and a smaller one at tornus; fringe white at apex and at tornus. Secondaries blue-black shot with brighter blue; a broad white band from costal margin to vein 3, preceded on costa by a small red spot; fringe white except at middle of outer margin. Below the white is more extensive; apices white; a white spot near anal angle.

Expanse, ♂, 61 mm.

Hab. Guapiles, Juan Vinas, Tuis, Carillo.

Named after Mrs. W. Reed, of whose hospitality at Guapiles I have the pleasantest recollections.

This species is easily distinguished from *C. drucei*, Schs., by the white band on hind wings, which starts at vein 8, whereas in *drucei* the spots are all below vein 6.

Pericopis fortis, sp. n.

♂. Head, tegulæ, and thorax black; a large creamy yellow spot anteriorly on patagia. Abdomen red above; a subdorsal and a lateral black streak; a transverse black streak on last segment; underneath yellowish. Primaries dark brown; a semihyaline postmedial space irrorated with brown, broad on costa to below subcostal, narrowing at tornus; this space is outwardly angled between veins 4 and 5, and contains a large brown spot outwardly edged with yellowish at end of cell, and a brownish streak extending upwards from tornus; a small red spot at base of costa, and below it a yellowish spot and short streak; underneath there is a red streak at base of costa, and reddish-brown suffusions above the discal spot, and subterminally from the costa to vein 2, also some indistinct marginal whitish spots. Secondaries semihyaline, the veins black; the costal margin brown, with a reddish streak below vein 7 in cell; the inner margin ochreous clothed with long dark brown hairs; a broad subterminal ochreous band inwardly edged with black; the outer margin black, inwardly dentate, and containing a row of small white spots. Underneath the inner and costal margins, also the subterminal shade, are more of a reddish tinge.

Expanse 79 mm.

The ♀ has the semihyaline space more opaque and forming more of a curve on its inner side; it is distinctly yellowish irrorated with brown, and the brown shade above tornus is more distinct, bifurcating below discal spot. The secondaries are ochreous, and the veins only black beyond an outer irregular black line; the outer margin as in the ♂, a few black hairs on inner area. Underneath there is some yellow on primaries near the base.

Expanse 84 mm.

Allied to *P. lygdamis*, Druce, of which I have both sexes, but displaying distinct characters.

Hab. Tuis, Carillo, Juan Vinas.

Pericopis guapa, sp. n.

♀. Palpi, head, and tegulæ black spotted with white. Thorax dark brown; white spots anteriorly and posteriorly; the patagia with a black streak. Legs black streaked with white. Abdomen reddish brown above; a black subdorsal line; a lateral black band divided by a fine grey line; underneath yellowish with reddish-brown hairs at anus. Primaries above blackish brown; a marginal row of white spots; a row of indistinct pale streaky spots from costa across end of cell, and two subterminal spots below vein 2; a row of five semihyaline whitish spots from costa beyond cell to vein 3. Secondaries reddish brown; the veins and scattered scales at base black; the costa narrowly black, the outer margin broadly black with a row of creamy-white spots. Underneath the primaries are black, marked as above; the secondaries have a red spot or streak at base of costa, sometimes no black irrorations and some yellowish spots beyond the cell contiguous to the black outer margin.

Expanse 66 mm.

Hab. Guapiles and Bugaba.

This species is allied to *P. ithomia*, Feld., and at first I thought it might be the ♀ of that species, but Mr. Druce has a ♀ similar to the ♂ in his collection.

Pericopis viuda, sp. n.

♀. Head and thorax dark brown. Legs brown streaked with yellow. Abdomen above ochreous, divided into a double row of large spots by a broad black subdorsal band and narrow transverse black lines; laterally black with a yellow line, interrupted by black transverse lines; underneath yellow banded with black; anus red. Primaries above brown, darkest on basal half, with a large blackish-brown spot in cell; one beyond cell and reaching costa; a subapical inwardly-curved shade and a subterminal shade from vein 3 to inner margin; outer margin also darker, with some curved lines between the veins faintly yellowish and preceded by a reddish-brown shade, very faint and indistinct. Underneath ochreous and yellow, the veins black; some red shading at base of costa; a black band crossing cell obliquely to median vein, then nearly straight to inner margin; a large black spot beyond cell from costa to vein 3; the subterminal black shades followed by a broken ochreous-brown shade; the outer margin irregularly black with a deeply wavy, broken, white line. Secondaries above and below ochreous, the veins black; the discocellular heavily black; a broad postmedial irregular black band; the outer margin black, inwardly dentate, and containing white spots between the veins.

Expanse 105 mm.

Hab. Tuis.

The ♂ of this fine species remains to be discovered.

Pericopis perplexa, sp. n.

♂. Legs black streaked with grey; fore coxæ yellow. Head, tegulæ, and thorax black; white spots on head and tegulæ; a white streak on thorax and on patagia. Abdomen above dark grey; a subdorsal and a lateral black streak; underneath whitish; anal hairs orange. Primaries smoky black, darkest on inner margin; a reddish streak at base of costa; semihyaline greyish streaks in and below cell, cut by an oblique blackish line; a longitudinal black line in cell; the broad oblique shade at end of cell, mottled with greyish from vein 2 to vein 4; four large whitish semihyaline spots subapically from veins 3–7; a marginal row of white spots. Secondaries whitish, semihyaline; the veins, costal and outer margins deep black, the latter with white marginal spots; a black shade across discocellular from costa to outer margin between veins 3 and 4; the inner area with blackish suffusions. Underneath the hyaline portions are whiter; red spots at base of costal margins.

Expanse 59 mm.

Hab. Sixola River.

This species may be the ♂, though so very different, of *Pericopis guapa*, Schs., and they are from different localities.

Phaloe levisi, sp. n.

♂. Legs and palpi black streaked with white. Head black spotted with white. Tegulæ spotted with red. Thorax dark brown; two white spots anteriorly. Abdomen black, a few white scales posteriorly on segments above; underneath banded with white. Primaries brown, the veins blackish; a red spot at base of costa, and a red streak beyond it; a semihyaline deep greenish-yellow streak across cell from costal vein to below vein 2; a similar curved band beyond cell, cut into four spots by the veins. Secondaries with the discal area from base deep greenish yellow, semihyaline; the margins very broadly black. Below the wings are black; a crimson streak at base of primaries; on secondaries a white streak on basal half of costa and another on basal half of inner margin.

Expanse 49 mm.

♀. On primaries only a broad semihyaline greenish-yellow band beyond cell narrowing to a point at tornus. Secondaries dark blue; a narrow curved semihyaline band well beyond cell, cut by the dark veins. Below a white spot at tornus on primaries; fringe white on secondaries near tornus.

Expanse 62 mm.

Hab. El Sitio, Juan Vinas.

There are three distinct forms of what may prove to be the same species: *Phaloe ninonia*, Druce, with the markings white; *Phaloe cotta*, Druce, with the markings pale yellow; and *Phaloe levisi*, with the markings greenish yellow.

Named after Mr. Lewis, of El Sitio.

XX.—*Additional Notes on a Collection of Land-Shells from Muswar Island, New Guinea.* By HUGH C. FULTON.

Papuina antiqua, Ad. & Rve.

Additional material from Muswar Island includes specimens which confirm the synonymy given in my former paper *; it consists of white and of uniform pale yellow specimens, the number of whorls varying from 4¾ to 5⅔. In the description of *P. horderi*, Sowb., it is said to have 6 whorls, but after having examined the type specimen in the British Museum, I find it should really be 5½, agreeing with the figure.

The following measurements will give some idea of the variation in size and form of this species:—

Maj. diam. 27½, alt. 31½ mm.
" 23½, " 34 "
" 29, " 32½ "
" 30, " 31 "

Papuina pratti, Fulton.

Further specimens show that this species is excessively variable in form, as the following measurements demonstrate:—

Maj. diam. 30, alt. 20 mm.
" 30, " 18 "
" 25, " 15 "
" 25, " 18 "
" 21½, " 20 "

Two varieties are worthy of note: in one the colour-band is almost or entirely lacking; the other is typical in form and coloration, but is thinner, and the interior of the aperture is strongly granular, perhaps the result of some disease suffered by the mollusc.

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* Ann. & Mag. Nat. Hist. ser. 8, vol. v., April 1910, p. 370.

XXI.—*On an undescribed Species of* Dorcasia.

By HUGH C. FULTON.

Dorcasia ponsonbyi, sp. n.

Shell depressed globose, moderately umbilicated, rather thin, subtransparent, yellowish brown above, whitish below; whorls 4½, slowly increasing, nucleus almost smooth, lower whorls with rather rough and irregular oblique striæ, *last whorl covered with a microscopic granular sculpture*; peristome thickened, yellow, margins joined by a slightly raised reddish callus, aperture subovate, pellucid within.

Maj. diam. 27, min. 22; alt. 16 mm.

Hab. Cape of Good Hope.

This shell has often been confounded with *Dorcasia lucana*, Müller, from which it can be readily separated by its depressed form and microscopic granular sculpture. The specimens of *lucana* seen by me are more or less malleated on the last whorl, a feature that is absent in *ponsonbyi*, which has also half a whorl less. In some specimens the peristome is whitish, in others it is of a reddish colour.

I have much pleasure in naming this shell in honour of J. H. Ponsonby, Esq., F.Z.S., who has done so much good work in connection with the South-African molluscan fauna.

XXII.—*Rhynchotal Notes.*—LI. By W. L. DISTANT.

African Pentatomidæ.

(Continued from p. 99.)

NEOCROLLIUS, gen. nov.

Head shorter than pronotum, longer than broad, the lateral and apical margins very strongly reflexed, the lateral margins concavely sinuate, lateral lobes with their apices obtusely acute, considerably passing apex of central lobe but not meeting beyond it; eyes prominent, subpedunculate; ocelli near base, much nearer eyes than to each other; antennæ five-jointed, first joint not reaching apex of head, first and second subequal in length, third and fourth subequal, fifth longest; pronotum shorter than broad, but more than half as long as broad, the anterior margin a little concave, the posterior margin straightly truncate, the lateral margins moderately reflexed and sinuate, the anterior angles strongly, broadly, obliquely produced, the posterior angles slightly notched or angulated; scutellum broad, about as long as the corium, its lateral margins concavely sinuate, its apex angularly rounded; membrane short, reaching the apex of the abdomen, longitudinally veined; body beneath imperfectly seen in carded type; legs of moderate size.

Allied to *Crollius*, Dist., in general appearance and structure, but the antennæ five-jointed, head strongly sinuate and reflexed, antenniferous tubercles not spinous; pronotum shorter and broader.

Neocrollius natalensis, sp. n.

Ochraceous, thickly darkly punctate; antennæ ochraceous, apical joint piceous; pronotum coarsely darkly punctate, between the humeral angles slightly, transversely, irregularly, palely, ochraceously levigate, the cicatrices broadly irregularly triangulate, piceous and narrowly margined with pale ochraceous, the lateral and anterior margins and the anterior angles pale ochraceous; scutellum finely wrinkled on basal half, the dark punctures a little more dense on apical half, a broad sublevigate obscure central fascia neither reaching base nor apex, on basal margin a central short line and a small spot near each basal angle pale levigate, the basal angles foveate and black; corium more finely punctate, the basal costal margin pale ochraceous; membrane pale fuscous with the veins piceous; sternum ochraceous, thickly darkly punctate; abdomen with the punctures paler and apparently with a broad central black fascia imperfectly seen in carded specimen; spiracles piceous; legs stramineous, apices of tibiæ and the tarsi blackish; other structural characters as in generic diagnosis.

Long. 6½ mm.

Hab. Natal; Durban (*Bell-Marley*).

IBAKA, gen. nov.

Head longer than broad, lateral margins moderately sinuate, apex broadly subtruncate, lobes of equal length, ocelli near base, a little nearer eyes than to each other; antennæ with the basal joint not reaching apex of head, second joint longer than third and subequal to fourth; pronotum including lateral angles about twice as broad as long, the lateral margins concavely sinuate, lateral angles broadly obtusely angularly prominent; scutellum not longer than broad at base, a large slightly raised levigate spot near each basal angle; corium almost as long as head and pronotum together, costal margin (excepting near base) distinctly convexly rounded; membrane about as long as pronotum; connexivum moderately exposed from beyond middle of corium; rostrum passing the intermediate coxæ, abdomen beneath globose.

Type, *I. natalicola*, Dist.

This genus will also comprise the *Cimex depressus*, Herr.-Sch., included by Stål in his genus *Ilipla*, which, however, is to be separated from *Ibaka* by the shape, size, and structure of the scutellum.

Ibaka natalicola.

Ilipla natalicola, Dist. Ent. Month. Mag. (2) xi. p. 82 (1900).

Hab. Natal; Durban.

Genus ANTESTIA.

Antestia, Stål, Hem. Afr. i. p. 200 (1864).

Type, *A. maculata*, Dall.

Antestia rufovittata, sp. n.

Black with sanguineous markings, apex of scutellum ochraceous; head with the apex of the central lobe, a spot before eyes, the outer and inner margins of the lateral lobes (sometimes the whole of the lateral lobes), and a few minute spots on basal area sanguineous; pronotum with the anterior and lateral margins (narrowly), two short submarginal fasciate lines on each side (sometimes fused), and a longitudinal fascia broadened anteriorly sanguineous; scutellum with the basal half black, where there is a central longitudinal line and a spot on each side sanguineous, the apical half brownish ochraceous; the apex ochraceous; corium with the base of costal margin, a transverse waved fascia on disk connected with the apical margin, all of which are sanguineous, claval margin obscurely ochraceous; membrane pale brownish ochraceous, the base blackish; connexivum sanguineous, with black segmental longitudinal lines or spots; body beneath and legs reddish ochraceous; two central spots to mesosternum, a large oblique spot on each side of metasternum, a broad broken marginal fascia and margins of the last two segments to the abdomen, black; antennæ ochraceous, apex of fourth joint, and fifth joint excluding base, piceous; first joint not reaching apex of head, second a little shorter than third, fourth and fifth a little longer and subequal in length; pronotum finely wrinkled and somewhat coarsely punctate; scutellum finely transversely wrinkled and punctate, the apex almost impunctate; corium coarsely punctate, excepting the sanguineous markings which are levigate; membrane passing the abdominal apex; rostrum slightly passing the posterior coxæ.

Long. 6 mm.

Hab. South Africa; Prieska (S. Afr. Mus.).

Allied to *A. variegata*, Thunb., but a smaller and narrower species; markings very distinct.

Genus Dalsira.

Dalsira, Amy. & Serv. Hist. Hém. p. 175 (1843).

Type, *D. marginata*, Amy. & Serv.

Dalsira atricostata, sp. n.

Ochraceous; corium more or less sparsely finely spotted with black, the costal margin prominently shining jet-black, which is also seen beneath at the lateral margins of the sternum; head about as broad as long, anteriorly somewhat concave, the lateral lobes finely rugulose, sometimes but not always with a few very small scattered black spots; antennæ ochraceous, first joint not reaching apex of head, second much longer than third or fourth, which are subequal in length, fifth joint longest; pronotum with the posterior area very strongly transversely rugose, these rugose lines more or less concavely waved, the anterior half more obscurely transversely rugose, near the anterior margin only punctate and with a few very small black spots, the lateral margins finely denticulate, the lateral angles subtruncately prominent; scutellum with a few scattered very small black spots, the basal half prominently transversely rugose, the posterior half obsoletely so, and these with its lateral margins and apex punctate; corium thickly obscurely finely punctate, the jet-black costal margins strongly crenulate; membrane pale greyish ochraceous, with scattered minute piceous spots; body beneath and legs ochraceous; head beneath, sternum, and abdomen with minute scattered black spots; legs unspotted; rostrum with a central line and the apices of the joints piceous.

Long. 20 to 24 mm.

Hab. Uganda (*Scott Elliot*, Brit. Mus.); Ruwenzori (*Scott Elliot*, Brit. Mus.).

In shape and structure allied to *D. plicata*, Reiche &

Fairm., from Abyssinia, but at once separated by the antennæ and the strongly crenulate jet-black costal margin to the corium.

TANTIA, gen. nov.

Head long, triangular, obliquely narrowed to apex, as long as breadth at base (including eyes), lateral lobes longly passing central lobe, their apices subacute; antennæ with the second and third joints subequal in length, fourth a little shorter than fifth; pronotum about half as long as breadth between the lateral angles, from between which it is deflected towards apex, the lateral margins denticulate, the lateral angles shortly angularly subspinous; scutellum as long or slightly shorter than head and pronotum together, attenuated from about one-third from apex; corium about as long as breadth between pronotal lateral angles; membrane reaching abdominal apex; other characters generally as in *Metonymia* and *Dalsira*, from which *Tantia* is at once separated by the structure of the head, which character taken by itself allies it to *Schismatops*.

Type, *T. gelei*, Dist.

This genus also includes *P. vicina*, Sign., *P. striata*, Sign., and *D. albopunctulata*, Bergr.

Tantia gelei.

Schismatops gelei, Dist. Bull. Soc. Ent. Belg. 1890, p. lx.
Dalsira gelei, Schout. Wien. ent. Zeit. xxiv. p. 55 (1905).
Metonymia gelei, Kirk. Cat. Hem. (Heterop.) i. p. 244 (1909).

Hab. Congo.

MAGWAMBA, gen. nov.

Body elongate, about two and a half times as long as breadth between the pronotal angles; head about as long as breadth at base including eyes, the lateral lobes meeting in front of the central lobe for about half their length and only slightly divergent at their extreme apices, ocelli at base, very much nearer to eyes than to each other; antennæ with the basal joint about extending to half the length of head, second and third subequal in length, each shorter than fourth or fifth, which are also subequal and more robust; rostrum reaching the anterior coxæ; pronotum about half as long as greatest breadth, deflected from a more or less distinct transverse line between the humeral angles, which are broadly rounded and only slightly prominent, the lateral margins oblique, entire, not denticulate, slightly reflexed; scutellum elongate, about one and a third times as long as breadth at base, prominently attenuated from a little beyond middle; corium narrow and elongate, about three times as long as broad; membrane longitudinally somewhat furcately veined; legs somewhat robust; tibiæ sulcate.

Magwamba purpurascens, sp. n.

Body and legs purplish red; membrane greyish white; antennæ purplish red, fifth joint and apical half of fourth paler; head and anterior half of pronotum (in fresh and unrubbed specimens) more or less greyishly pubescent; head with the lateral lobes obliquely irregularly striate, central lobe somewhat thickly punctate; pronotum finely transversely wrinkled and punctate, the lateral areas obliquely or transversely obscurely striate; scutellum finely wrinkled and punctate; corium thickly, finely punctate, membrane greyish white, with a few small piceous spots; other structural characters as in generic diagnosis.

Long. 17 to 19½ mm.

Hab. N.E. Rhodesia; Serenje District, Congo Free State, W. of Kambove, 3500 to 4500 feet (*Neave*, Brit. Mus.); Ovampo Land (Coll. Dist.).

Genus GELLIA.

Gellia, Stål, Hem. Afr. i. p. 243 (1864).

Type, *G. albivittis*, Germ.

Gellia bicolorata, sp. n.

Head, antennæ, scutellum, and corium reddish testaceous; pronotum black, the inner margin of the produced apical angles narrowly pale, the basal margin more or less reddish ochraceous; membrane pale, subhyaline; head broad, concave, a little broader near apex than at base; antennæ with the first joint longer than either second, third, or fourth, but shorter than fifth, second slightly shorter than third which is slightly shorter than fourth; pronotum with the lateral angles about reaching middle of head, their apices obtusely subacute, the whole of the lateral areas including apices rugulose, a moderately distinct transverse ridge between the humeral angles, the whole disk finely transversely rugulose; scutellum finely transversely rugulose; corium somewhat thickly finely punctate; head beneath reddish testaceous; sternum and abdomen beneath ochraceous; prosternum with the lateral areas black, finely transversely rugulose; meso- and metasterna spotted with black on each side, the latter with a large lateral spot; abdomen with two discal series of black spots and with a series of submarginal segmental black lines; legs more or less castaneous.

Long 14 mm.

Hab. Congo Free State, W. of Kambove, 3500–4500 ft. (*Neave*, Brit. Mus.).

Gellia dilatata.

Phyllocephala dilatata, Sign. Ann. Soc. Ent. Fr. 1851, p. 346, pl. x. fig. 13.

Hab. Congo Free State; Katanga, Lufira R., W. of Kambove (*Neave*, Brit. Mus.).

This species is not included in Schouteden's Catalogue of the Pentatomidæ of the "Congo Belge." The allied species described by Schouteden (*G. tristis*) was, on the contrary, not found by Mr. Neave.

Gellia incognita, sp. n.

Head and pronotum pale ochraceous; basal margin of pronotum, corium, and membrane black; scutellum ochraceous, punctured and mottled with black; body beneath piceous brown; anterior half of head, lateral margins of sternum, coxæ, rostrum, and a central longitudinal fascia to abdomen paler in hue; head concave, laterally somewhat thickly punctate, distinctly angulately narrowed in front of eyes; pronotum with the anterior angles of the dilated lateral margins subacute, but not quite reaching middle of head, the whole surface more or less finely transversely rugulose, margins of the cicatrices black, the black basal margin notched inwardly; scutellum finely transversely rugulose; corium thickly finely punctate; antennæ piceous, basal joint longer than either second or third, second shorter than third, which is almost subequal in length to fourth, fifth longest and moderately incrassate; sternum sparsely coarsely punctate, abdomen beneath thickly finely punctate; anterior legs piceous (remaining legs mutilated in type).

Long. 12 mm.

Hab. —— ?

I have had this specimen in my collection without a locality for more than twenty years. I feel now that it ought to be described, for its colour-markings and structure are very distinct. It is more than likely to prove an African species.

Genus Gonopsis.

Gonopsis, Amy. & Serv. Hist. Hém. p. 180 (1843).

Type, *G. denticulata*, Amy. & Serv.

Gonopsis bovilla, sp. n.

Above brownish or reddish testaceous, anterior area of pronotum and the head more ochraceous; membrane greyish, the veins prominent and somewhat pale fuscous; connexivum stramineous; body beneath pale ochraceous and darkly punctate; abdomen beneath with three longitudinal impunctate fasciæ, the central straighter and narrower; legs ochraceous, the femora darkly punctate, tibiæ reddish testaceous with their margins ochraceous, tarsi reddish testaceous; pronotum with the lateral angles longly and somewhat forwardly produced, robustly spinous, with their apices subacute, their posterior margins transversely wrinkled and black; head somewhat thickly and coarsely punctate, the lateral margins a little sinuate in front of eyes, apices of the lateral lobes well separated and subacute; antennæ reddish testaceous, second joint slightly longer than third; anterior area of pronotum coarsely punctate, the lateral margins denticulate, between the lateral angles a transversely concave levigate line, behind which the surface is punctate and rugulose; scutellum punctate and rugulose, some obscure black punctures centrally and laterally; corium thickly coarsely punctate; stigmata black.

Long. 14½ to 15½ mm.

Hab. Natal; Drakensberg Mts. (Brit. Mus.), Durban (S. Afr. Mus.).

Allied to *G. angularis*, Dall, but with the lateral pronotal angles forwardly and more strongly produced.

Gonopsis humeralis, sp. n.

Head and anterior area of pronotum ochraceous, blackly punctate; posterior area of pronotum, scutellum, and corium purplish black; membrane greyish white; connexivum reddish testaceous; body beneath pale testaceous, abdomen beneath more or less reddish testaceous; legs dull reddish; antennæ reddish testaceous, second and third joints almost subequal in length; head with the lateral margins slightly sinuate in front of eyes, the lateral lobes only divergent at extreme apices, which are subacute, lateral margins narrowly levigate and testaceous; pronotum with an almost levigate transverse line between the humeral angles, in front of which half the surface is transversely rugulose, the other anterior half somewhat finely punctate, lateral margins denticulate, lateral angles strongly robustly subangularly produced, slightly directed forwardly, posterior area reticulately rugulose; scutellum transversely rugulose; corium thickly finely punctate; sternum sparingly punctate, disk of abdomen impunctate.

Long. 17 mm.

Hab. Ovampo Land.

Gonopsis lineata, sp. n.

Head, pronotum, and scutellum ochraceous; pronotum with a transverse fascia between the humeral angles and extending to their apices, black (in some specimens the fascia is more or less obsolete); corium brownish ochraceous; membrane greyish subhyaline, but reflecting the ochraceous abdomen beneath; connexivum stramineous, inwardly margined by a black line; body beneath and legs pale ochraceous, finely darkly punctate; abdomen beneath with a central longitudinal levigate central fascia; head with the lateral margins nearly straight, scarcely perceptibly sinuate before the eyes, apices of lateral lobes only separated at apices which are subacute; antennæ reddish testaceous, second and third joints subequal in length, second almost reaching apex of head; pronotum with the lateral angles straightly transversely subacutely produced, the lateral margins denticulate, the whole surface more or less finely darkly punctate, and the anterior area distinctly transversely rugulose; scutellum transversely rugulose, somewhat darkly punctate on the lateral margins; corium thickly finely punctate; membrane not reaching apex of abdomen; sternum distinctly darkly punctate.

Long. 15 to 17 mm.

Hab. Southern Congo Region.

Genus CYCLOPELTA.

Cyclopelta, Amy. & Serv. Hist. Hém. p. 172 (1843).

Type, *C. obscura*, Lepel. & Serv.

Cyclopelta abyssinica, sp. n.

Black; base of first joint of antennæ and the legs castaneous, tarsi black; antennæ robust, second joint twice as long as third, a little longer than fourth; head, pronotum, scutellum, and corium thickly finely punctate, apical area of scutellum and disk of corium more or less rugulose.

Long. 13½ to 14½ mm.; max. breadth 8½ to 9½ mm.

Hab. Abyssinia; Didessa River, 1400 ft., Gamu, 2800 ft., Nono, 3600 ft. (*Zaphiro*, Brit. Mus.).

Closely allied to the West African *C. funebris*, Fabr., but differing in the colour of the legs and the shorter antennæ, of which the second joint is twice as long as the third.

Genus Aspongopus.

Aspongopus, Lap. (part) Ess. Hém. p. 58 (1832).

Type, *A. janus*, Fabr.

Aspongopus circumcinctus, sp. n.

Black; lateral margins of pronotum, basal lateral margins to corium, connexivum, and body beneath ochraceous; legs fuscous brown; antennæ black, the basal joint testaceous, second joint slightly longer than third; third and fourth joints subequal in length, fifth longest, cylindrical and pilose; head about as broad as long, the apex broadly truncate, irregularly punctate; pronotum about two-thirds as long as broad at base, the lateral margins moderately ampliate and rounded, very finely and thickly punctate and slightly transversely wrinkled; scutellum about as long as broad at base, very finely and thickly punctate and slightly transversely wrinkled; corium about as long as membrane, wrinkled, but not apparently punctate; body beneath more or less finely darkly speckled or punctate, the central disk of sternum more prominently so.

Long. 12 mm.

Hab. Congo Free State, Kambove, Katanga, 4000–5000 ft. (*Neave*, Brit. Mus.).

XXIII.—*Notes on African Rodents.*

By Oldfield Thomas.

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I. *A new Genus of Gerbils.*

Further study shows that the group of small Gerbils which contains "*Gerbillus*" *emini* and its allies, of recent years placed in *Tatera*, form so natural and distinct a section that they might well be recognized as a special genus, which I would propose to call

TATERILLUS, gen. nov.

External characters as in *Tatera*, but the soles with a band of fine hairs passing across them opposite the base of the hallux.

Skull with the posterior palatal foramina much longer than in other Gerbils, commencing, as a rule, opposite the anterior edge of m^1 and reaching back to the middle of m^2. Bullæ comparatively small.

Incisors narrow, deeply grooved, strongly bevelled, much more so than in *Tatera*.

Type. Taterillus emini (*Gerbillus emini*, Thos.).

Other species: *T. gracilis*, Thos., *harringtoni*, Thos., and *lacustris*, Thos. & Wrought.

In some respects—in its rather more murine skull and smaller bullæ—*Taterillus* shows an approach towards the smaller Gerbils such as *Dipodillus* and *Gerbillus*, its partially hairy soles perhaps being also an indication of its connexion with the last-named genus.

II. *The Species of* Lophiomys.

In working out some examples of *Lophiomys* from British East Africa, obtained during the recent Rudd expedition, I find that there are two species in that country, and in formulating their characters I have had occasion to go over all the described forms, with results which are here briefly noticed.

The first member of this remarkable genus to be described, *L. imhausi*, M.-Edw., was founded on a specimen purchased alive at Aden, a place to which Somali animals are very commonly brought for sale. The two specimens from Somali in the British Museum, practically topotypes of *L. smithi*, Rhoads, agree so closely in all respects with Milne-Edwards's description that I have no doubt that *L. smithi* should be regarded as a synonym of *L. imhausi*.

The various Abyssinian specimens that have been sent home, chiefly by the Italians, should probably be referred to *L. æthiopicus*, Peters, but if that is yet another species the name *L. bozasi* is available for the Abyssinian form. No detailed description is available of the type of *L. æthiopicus*, which was obtained near Kassala.

In East Africa the type of *L. testudo*, Thos., was obtained by Mr. F. J. Jackson at Ravine Station, and other specimens have since been referred to it. But now examination proves that the type remains unique, and that all the other E. African specimens available belong to a larger species closely allied to the Abyssinian one and itself divisible into two subspecies.

Subjoined are the diagnostic characters of the four species which at present appear to be recognizable.

In drawing them up I have had for examination two specimens of *L. imhausi*, two of *L. bozasi* (including one skull belonging to the United States National Museum), six of *L. ibeanus* (including a U.S.N.M. skull from Nakuru), and one—the type—of *L. testudo*.

Size comparatively large. Frontal region concave. Mesopterygoid fossa long. Anteorbital foramen high, narrow, slit-like. Palatal foramina long. Sides of premaxillæ not or scarcely granulated, except along the edge bordering the nasals. (Abyssinia.) *L. bozasi*, Oust. (probably *L. æthiopicus*, Peters).

Size variable. Frontal region more normal. Mesopterygoid fossa long. Anteorbital foramen larger and more open; its outer edge thickened into a ridge, with a large masseteric knob at its lower end. Palatal foramina shorter. Sides of premaxillæ heavily granulated, especially in the fossa just above the incisors. (British E. Africa.) .... *L. ibeanus*, sp. n.

- Size and teeth smaller. (Mau Region.) .... *L. ibeanus ibeanus.*
- Size and teeth larger. (Aberdare Range.) ...... *L. i. hindei*, subsp. n.

Size smaller. Mesopterygoid fossa very short. Anteorbital foramen very small, low, well open, its outer edge practically without strongly marked ridge or masseteric knob. Nasals markedly narrowed in their posterior half, parallel-sided in all the other forms. Incisors narrow, dead white in front, cream-coloured in other species. Line of glandular bristles on sides narrower and less conspicuous than in other species. (British E. Africa.)............................... *L. testudo*, Thos.

Size smallest. Mesopterygoid fossa long. Anteorbital foramen comparatively large, well open, its edge ridged and with well-marked masseteric knob. Frontal region prominently white, grey in the other species. (Somali-land.) .... *L. imhausi*, M.-Edw. (syn. *L. smithi*, Rhoads).

The following are the chief diagnostic measurements of the skulls :—

		L. ibeanus.			
	L. bozasi. 25465 U.S.N.M.	Subsp. typ. Type 2. 2. 6. 2.	Subsp. *hindei.* Type 10. 5. 3. 152.	*L. testudo.* Type 90. 8. 4. 97.	*L. imhausi.* 8. 4. 31. 1.
Upper length (tip of nasals to back of interparietal)	62·5	60	62	56·7	55
Greatest breadth	42·5	38·5	42·5	38	35·5
Anteorbital foramen, height	7·5	7·4	7·4	5·2	6·6
Palatine foramina, length	13·3	11	10·7	9·5	10·2
Mesopterygoid fossa, to tip of hamular processes	14	13·4	14	10	13·2
Upper molar series ..	14	12·8	13·8	12·9	11·2

L. ibeanus, the species now described as new, is coloured quite like the Abyssinian form referred to *L. bozasi*, and has equally prominent lateral stripes.

Its skull-characters are as described above, but as the Aberdare specimens are larger and have larger teeth than those from the Mau region, it appears to be necessary to recognize the former as a special subspecies, which may be named *L. i. hindei*, after the donor of the first specimen received by the National Museum. The skull-measurements of both forms are given above.

Type of *L. ibeanus*:—

Adult female. B.M. no. 2. 2. 6. 2. Captured by S. Couper at Mile 513 of the Uganda Railway (between Londiani and Lumbwa Stations) in Mau region; altitude about 7000′. Presented by C. Stewart Betton, Esq.

Another from El-Burgon, presented by C. S. Betton, and a third from the Mau Forest near Njoro, collected and presented by Capt. F. W. Barrett.

Type of *L. i. hindei*:—

Adult female. B.M. no. 10. 5. 3. 152. Original number 801. Collected 15th March, 1910, by Robin Kemp at Mutaragwa, Aberdare Mountains. Alt. 9000′. Presented by C. D. Rudd, Esq.

A second specimen from the same place, now in the Royal Scottish Museum; also an extra skull picked up dry.

Another, the first received by the Museum, from the Aberdare Mountains, without detailed particulars. Presented by S. L. Hinde, Esq.

XXIV.—*Hornless Okapies.* By R. Lydekker.

A few weeks ago Mr. Rowland Ward had on exhibition at his establishment in Piccadilly the mounted skin of a hornless okapi remarkable on account of its large size, a feature in which it agrees with the typical specimen presented by Sir Harry Johnston to the British Museum, and described by Sir Ray Lankester in the 'Transactions of the Zoological Society,' vol. xvi. pt. 6 (1902). In respect of their large stature, both these specimens differ from the two horned okapies exhibited in the Museum alongside the one presented by Sir H. Johnston. The skull associated with it indicates, from the circumstance that the premolars are not fully protruded, that the latter is immature; and although the stature of the animal may have attained its full development, it is probable that there would have been some increase in the size of the skull. Although no sexual features are shown in the skin, Sir Harry Johnston's specimen is now generally regarded as a female; and if this be the case, the same will hold good for the one recently in the possession of Mr. Ward. Of the former the shoulder-height (as mounted) is 5 feet 1 inch (153 cm.), while that of the second is 5 feet and ½ inch (152·3 cm.). On the other hand, the horned example presented to the Museum by Major Powell-Cotton stands only 4 feet 8½ inches (144·5 cm.) at the shoulder, while the somewhat younger one given by the late Mr. Boyd Alexander is 4 feet 5½ inches (136·5 cm.). The former of these, as indicated by the skeleton mounted in the same case, is adult, although not old, and has, I infer, approximately reached its full size. The length of the skull is 339 mm.

In the memoir by M. Fraipont published in the 'Annales' of the Congo Museum no details are given with regard to the height of the mounted specimens referred to; but a horned example at Madrid described by Señor A. Cabrera in 1907 is stated to stand 4 feet 5 inches (137 cm.) at the withers, and, so far as I can recall, none of the mounted specimens with horns which have been shown from time to time at Mr. Ward's establishment were equal in size to the aforesaid hornless examples.

So far, then, as the evidence of the five specimens mentioned is concerned, it is manifest that the hornless individuals exceed in height those with horns to an extent which can scarcely be explained by difference of age, especially when it is borne in mind that one of the hornless examples is immature, while at least one of those with horns is adult. Neither does it seem that such differences are within the ordinary limits of individual variation.

On the other hand, it has to be mentioned that while the skull of Sir H. Johnston's immature hornless specimen measures 375 mm. in length, that of a horned okapi in the Tervueren Museum has a length of 377 mm. (Lankester, *op.*

cit. p. 305). The English skull is, however, broader than the Belgian one, their respective transverse diameters being 182 and 178·5 mm. As the latter is adult and the former immature, the English skull might eventually have somewhat exceeded the Belgian in length. Be this as it may, I am informed by the Director of the Tervueren Museum that the mounted skin of the specimen to which the skull pertained is 4 feet 8¾ inches (145·5 cm.) in height, or practically the same as specimens in which the skull-length is only 339 mm.

Although, as mentioned above, no decisive evidence of this is afforded by the two English mounted specimens, hornless okapies are regarded as females. On the other hand, all the horned examples that have come under my notice are undoubtedly males; and since the Ituri natives affirm that the bulls are armed while the cows are defenceless, the existence of this secondary sexual difference may be at least provisionally accepted.

Assuming, then, the hornless specimens to be truly females, the foregoing data indicate that female okapies are larger than males. The alternative would appear to be that there is a larger and a smaller form ; but this I hesitate to admit, more especially as I have not seen either an adult male agreeing in stature with the females or an adult female corresponding in size to the males, the smaller of the two hornless skulls presented to the British Museum by Sir H. Johnston indicating a comparatively young animal.

XXV.—*Two new African Mammals.*

By GUY DOLLMAN.

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PRIONOMYS, gen. nov. (*Muridæ*).

Size similar to that of a large species of *Dendromus*. Fore feet with four well-formed digits; pollex suppressed. Digits II.–IV. moderately elongated, with short claws; outer or V. digit only about half the length of the two middle fingers, with a small inconspicuous nail. Hind feet with five digits, all provided with claws. Hallux stout, about half the length of the middle toe; claw on hallux smaller and blunter than those on the other toes. Ears rounded and simple, with no internal folds such as occur in *Dendromus*. Tail long and almost naked.

Skull with a broad square-shaped brain-case; zygomatic breadth very much greater than in *Dendromus*, zygoma set in a nearly parallel position. Squamosal portion of zygoma broad and horizontally expanded. Palate and pterygoid regions much as in *Dendromus*. Palatal foramina and nasals much shorter than in *Dendromus*. Lower jaw with very short coronoid processes, not rising above the level of the condyles. Angular processes inflected inwards, more so than in *Dendromus*.

Teeth: upper incisors short, slender, ungrooved, and thrown forwards, projecting anteriorly beyond the nasals, somewhat as in *Uranomys*. Upper molar teeth broad and fairly large, highly cuspidate; the cusps arranged very much as in *Dendromus*, though in *Prionomys* the cusps are raised up into sharp recurved points, their grinding-surfaces facing backwards, resembling in this respect the genus *Mylomys*. Cusp-formula of the three laminæ of m^1 as in ordinary Dendromyinæ, 2 . 3 . 2. Internal cusp large and well-developed. Longitudinal grooves between the outer and median cusps and median and inner cusps, sharply defined, the outer of the two grooves straight and uninterrupted throughout the whole length of the tooth. Outer cusps of the three laminæ rather taller than those of the median series and laterally compressed. No trace of the small median anterior supplementary cusp which is present in *Dendromus*. M^2 with cusps arranged on much the same plan as in m^1, the two longitudinal grooves well-marked and the cusps avicularian. Inner cusp well developed. Longitudinal groove between median and external cusps of the laminæ as evident as in m^1. M^3 small and simple, composed, as in *Dendromus*, of two small cusps with a groove between them. Lower incisors slender and sharply pointed, set in a more horizontal position than in *Dendromus*. Lower molars, like the upper series, highly cuspidate, only here the cusps are curved in the opposite direction, their tips and concave grinding-surfaces facing forwards. M_1 composed of three laminæ of two cusps each, cusp-formula 2 . 2 . 2. Median longitudinal groove between the outer and inner cusps of the three laminæ deep, straight, and clearly defined. Postero-internal cusp small. Inner cusps, with the exception of the postero-internal, rather taller than outer series. M_2 with four prominent cusps, two on either side of the deep longitudinal groove. M_3 larger than the corresponding tooth in the upper jaw; composed of two cusps, one on either side of a median groove.

Type, *Prionomys batesi.*

This genus would appear to be more nearly related to the genus *Dendromus* than to any other of the allied genera. The teeth, while resembling those of *Dendromus* to a certain extent in their general arrangement, possess such curiously shaped cusps that it is evident at once, from this character alone, that the two genera are quite distinct. The general appearance of the skull, with the ungrooved slanting incisors, short palatal foramina, and great breadth of the brain-case and zygoma, is quite unlike that of any other member of the Dendromyinæ.

Externally the animal exhibits a series of characters quite as distinct as those of the skull. Though resembling *Dendromus* in the possession of a long prehensile tail, it is readily distinguished by the occurrence of four well-formed digits on the fore feet and by the presence of comparatively small simple ears.

Prionomys batesi, sp. n.

General appearance and size much the same as a large species of the genus *Dendromus.*

Ears rather small and rounded, thinly clad on both surfaces with short dark hairs. Feet as described above. Fur soft and rather short, measuring 4 or 5 mm. in length on the back. Whiskers long and fairly numerous, with black bases and greyish tips. General colour of upper surface pale chocolate (between chocolate no. 2 and otter-brown no. 4, 'Repertoire de Couleurs'), paling on the flanks and passing almost imperceptibly into the greyish tint of the ventral surface. Face between eyes rather paler than rest of upper parts; sides of face below eyes lighter and washed with pinkish buff. Eyes surrounded by narrow blackish rings. Individual hairs of body dark slaty grey with chocolate-buff tips. Back of hands and feet covered with very short whitish hairs, a few darker hairs on the metacarpal and metatarsal regions. Entire underparts grey, washed with pale pinkish buff; hairs with pale slate-grey bases and long pinkish-buff tips. Tail blackish brown, thinly clad with a number of minute brownish hairs, appearing at first sight almost naked. Apical portion of upperside of tail devoid of hair, probably prehensile, as in *Dendromus.* Lower surface of tail similar to upper, except that the minute hairs extend right to the tip.

Skull broad and stoutly built, zygomatic arches widely spread, the zygomatic breadth being rather greater across the squamosal region (14·7 mm.) than across the maxillary region (14·1 mm.). Nasals fairly broad anteriorly, narrowing posteriorly. Brain-case as described above. Palatal foramina short, terminating posteriorly about 1 mm. in front of the anterior level of the molar series. Auditory bullæ small and rather flat. Teeth as described above.

Dimensions of the type (measured in the flesh):—

Head and body 59 mm.; tail 99; hind foot 15; ear 12.

Skull: greatest length 24; basal length 20·7; condylobasal length 22·5; basilar length 19·2; condylo-basilar length 21; zygomatic breadth 14·7; interorbital breadth 4·9; breadth of brain-case (behind squamosal region) 11·3; nasals, greatest length 8·3, greatest breadth 2·7, least breadth 1·3; palatal length 12·4; palatilar length 11; width of palate, just anterior to inner cusps of m^1, 3·2; length of palatal foramina 3·7; post-palatal length 8; length of upper cheek-teeth 4·6; length of m^1 2·7; length of m^2 1·7; length of upper incisors 3·3.

Hab. Bitye, Ja River, Cameroons. Altitude 2000 feet.

Type. Adult male. Original number 506. Collected by Mr. G. L. Bates on February 21st, 1910.

I have named this interesting mouse after the collector, Mr. G. L. Bates, whose name is already associated with so many remarkable West African mammals.

Acomys ignitus, sp. n.

Allied to *Acomys selousi*, de Wint., but larger and very much brighter in colour.

Size and general proportions much as in *A. mullah*, Thos.; tail rather shorter, about equal in length to that of *A. witherbyi*, de Wint. Ears comparatively small. Texture of pelage about as in *A. witherbyi*, slender, rather spinous hairs on head, shoulders, anterior back, flanks, and entire ventral surface, and broad, flattened spines on the rump and posterior back. General colour of upper surface brownish orange, becoming brighter in colour on the flanks (dead leaf no. 1 mixed with tan colour no. 1, 'Repertoire de Couleurs'). Line of demarcation between the reddish flanks and white ventral surface sharply defined. Flattened spines of posterior back slate-grey, turning orange towards the tips, the extreme tips brownish. Spinous hairs on flanks with light slate-grey bases, buffish towards the middle and deepening to reddish orange in the terminal portions. Backs of hands and feet white. Entire underparts white; hairs white to the roots. Tail stout and a great deal more scaly than in *A. selousi*, the whole tail much coarser, owing to the scales being larger and the short bristle-like hairs more fully developed. Tail above silvery grey, covered with short black bristles; underside similar, but with white hairs.

Skull much larger than that of *A. selousi*, about equal in size to that of the Somaliland species, *A. mullah*. Nasals long and rather narrow. Palatal foramina extending back to behind the level of the middle of the first molar; in *A. selousi* the palatal foramina do not extend back beyond the level of the anterior lamina of m^1. Auditory bullæ rather prominent.

Dimensions of the type (measured in the flesh):—

Head and body 109 mm.; tail 89; hind foot 16·5; ears destroyed. (In another specimen, from the type locality, the ears are given as 17 mm. in length.)

Skull: greatest length 30·5; basal length 25·4; condylobasal length 28; basilar length 23·4; condylo-basilar length 25·5; zygomatic breadth 15·2; interorbital breadth 5; breadth of cranium (across squamosal region) 13·5; nasals, greatest length 11·3, greatest breadth 2·9, least breadth 2; length of palatal foramina 7·5; width of palate (inside m^1) 3; width across palate (outside m^1) 6; length of upper cheek-teeth 4·3.

Hab. Voi, British East Africa. Altitude 2000 feet.

Type. Adult male. B.M. no. 10. 6. 2. 120. Original number 878. Collected by Mr. R. Kemp on April 4th, 1910, during his work in connexion with Mr. C. D. Rudd's East African Expedition.

This handsome species is distinguished at once from *A. selousi* by its much larger size, brighter colour, and more hairy tail.

XXVI.—*Two new Oriental* Viverridæ.

By Ernst Schwarz.

Paradoxurus vicinus, sp. n.

A *Paradoxurus* of the *niger* type, most nearly allied to *P. minor* from Selangor, but larger and with longer fur; the dorsal stripes somewhat more indistinct, but not broken up into spots.

Upperside golden yellow suffused with black; underfur greyish. Five somewhat indistinct black stripes down the neck, of which the inner three only extend over the whole back. Sides of body lighter, very diffusely spotted. Hairs of crown buffy white, with black tips, so as to produce a grizzled effect. A large whitish frontal patch, divided into three by two narrow blackish-brown stripes which arise from above the eyes. A whitish patch below each eye. Muzzle (with the exception of the foremost part), cheeks, chin, and throat dull blackish brown. The two whitish whorls in front of the ears very conspicuous and partly reaching the frontal patch. Vibrissæ brown. Back of ears black. Limbs and the two distal thirds of tail brownish black. Hairs of underside dull brown, those of the belly with white tips.

Skull. Muzzle long and narrow; nasals long, narrow, forming a V-shaped point behind. Constriction marked. Bullæ of medium size, smooth and rounded. Teeth of the *P. niger* type. Carnassial somewhat more complex than in *P. niger.* m_1 triangular.

Type. B.M. no. 79.11.21.283. Collected by McClelland.

Dimensions of type:—

Head and body 525 mm.; tail 475 (measured on the skin).

Skull: upper length 105; zygomatic breadth 55; nasals 24 × 9·5; intertemporal constriction 12; width of braincase 35; rostrum, breadth across roots of canines 17; length of upper tooth-row from p_1–m_2 35·5; p_4, length 8·5, greatest diameter 10.

Hab. There are two specimens and two more skulls of this species in the collection of the British Museum, all collected by McClelland; on the back of one of the labels there is a remark by Blanford, "probably from Assam," and, judging from the collector, this locality is most probably correct.

This palm-civet has a superficial resemblance to *P. sumbanus*, but, apart from the larger size and softer fur, it has a dentition of the *niger* type, though with the carnassials rather more complex than the Indian species. From *P. niger*, its geographical neighbour, it is at once distinguished by its softer fur and different colour.

Mungos exilis peninsulæ, subsp. n.

This is a form of the *M. javanicus* group, of which *M. javanicus*, *M. exilis*, and *M. rubrifrons* (Allen, 1910) are described. It is most nearly allied to *M. exilis* from Annam, Cambodja, and Cochin China, but distinguished by its paler colour, especially the almost complete absence of red on the back.

Upperside greyish brown to greyish yellow, finely grizzled. Head dark reddish brown; chin yellowish rusty. Underside yellowish brown; hairs often annulated. Limbs light brown. Tail like back, with dark tip.

Skull. Brain-case shorter than in *M. exilis*; rostrum somewhat narrower and zygomatic arches wider. Bullæ much as in *M. exilis*, but somewhat smaller, different from those in *M. javanicus*, where the anterior auditory chamber is markedly lower than the posterior one. p_4 much as in *M. javanicus*, not concave behind as in *M. exilis*.

Type. ♂ ad. B.M. no. 98. 10. 21. 6. Collected by Capt. S. S. Flower.

Dimensions of type (collector):—

Head and body 326 mm.; tail 251; hind foot 59; ear 25.

Skull: basilar length 68; zygomatic breadth 39; width of brain-case 26; palatilar length 40; rostrum, breadth across roots of canines 14·8; constriction 9; length of upper tooth-row from c–m_2 26; p_4, length 7, greatest diameter 8.

Distribution. The Malay Peninsula and Lower Siam.

Type locality. Bangkok, Siam.

XXVII.—*New Neotropical* Geometridæ.

By Louis B. Prout, F.E.S.

The types of the following species are in my collection. They have for the most part been compared with the Warren types in the Tring Museum, as well as with the British Museum Collection and that of M. Dognin, and have been submitted to the examination of Mr. Warren, who is acquainted with most of the species described by Schaus and Bastelberger. The literature has also been carefully used. There is therefore good reason to hope that little has been overlooked which ought to have been studied prior to the erection of new species.

Subfam. *HEMITHEINÆ.*

(*Geometrinæ* auctt.)

Blechroma florifera, sp. n.

♂. 24 mm.—Face red-brown above, white below. Vertex and occiput pale green. Palpus black, with the first two segments white beneath. Antennal shaft white. Thorax green, pectus whitish. Fore and middle legs blackish anteriorly, mid tarsus paler, tibiæ and fore tarsus banded with white; hind leg wholly whitish. Basal segments of abdomen dorsally purplish fuscous with a white spot posteriorly, the rest green (partly discoloured), the fifth segment with a large fuscous dorsal spot, the sixth with a minute one. Fore wing with costa very narrowly light brown, marked with fuscous; the markings purplish fuscous, consisting of: a large central blotch, which may be somewhat fancifully likened to a four-petalled flower, four roundish lobes clustering round the still darker, streak-like cell-spot, the two proximal more separated than the two distal, and having between them a slight streak along the cell fold; numerous small spots in the costal area and at the base of the wing; and several transverse series, these forming an irregular, double, inner series, considerably oblique outwards from costa to M, a postmedian interneural series starting from an irregular oblique blotch at costa, thence nearly parallel with termen, a few interneural spots between the central blotch and this series, a subterminal and a terminal series of vein-spots, the latter extending on to the base of the otherwise pale, almost white fringe. Hind wing similarly marked, except at costa, but with the central blotch much smaller, fainter, and ill-defined. Underside paler; hind wing and inner marginal half of fore wing unmarked, costal half of fore wing marked nearly as above; terminal dots very small, on hind wing faint.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*).

Possibly a form, certainly a close relative, of *B. punctiseriata*, Dogn. Hét. Nouv. Amér. Sud (1) p. 18, recently published. My description was prepared some time before the appearance of M. Dognin's brochure, and as a few essential features (such as coloration of the face) seem to differ in the two forms, I have thought it better not to suppress it.

Blechroma rufipicta, sp. n.

♂. 27 mm.—Face dark brown, vertex green; palpus dark brown, rather rough-scaled, third joint whitish; antennal shaft above banded, whitish and dark grey. Thorax green above, marked with red-brown, whitish beneath; legs whitish, anterior femur and tibia with large fuscous spots above.

middle femur and tibia tipped with fuscous. Abdomen whitish, much marked with red-brown dorsally, except towards anus. Fore wing with apex and tornus sharper than in typical *Blechroma*; delicate light green, slightly iridescent; costa very narrowly yellowish; a bright red-brown basal patch and moderate-sized red spot just outside cell, the latter preceded by two much smaller spots of the same colour just within cell, one at the base of R^2, the other just below the cell-fold; five darker red-brown dots (on costa, C and SC at 3 mm., on M and SM at 4 mm.) represent the inner line; similar vein-dots from R^1 to inner margin near termen represent a subterminal series, slightly curved backwards, mostly very small, that on R^1 the largest; some dark red-brown dots between the central spot and costa; a short dark streak along SC$^{3-4}$ at apex, an amorphous dark blotch between costa and SC^5 subapically and another proximally to it between SC and R^1, also numerous scattered dark dots in this area; dark spots on termen at ends of SC^5, R^1, R^3, and SM^2, that at R^3 large and extending conspicuously into fringe; fringe pale. Hind wing with termen sinuous, slightly produced at R^3; a bright red-brown basal patch, rather long and narrow; very faint traces of a somewhat zigzag first line with two conspicuous spots, on M at 3 mm. and on inner margin at 4 mm.; subterminal vein-dots as in fore wing; dark spots on termen at ends of R^1, R^3, and SM^2, that on R^3 large and extending well into fringe. Underside paler, with fewer markings; fore wing with the apical and subapical as above and a costal dark streak from base to one-fifth, hind wing with a small dark spot in fringe at R^3.

Huancabamba, Cerro del Pasco, E. Peru.

A very distinct species. Seems to be a true *Blechroma*, in spite of slight differences in shape; SC^1 of fore wing anastomoses rather strongly with C, whereas in *conspersa*, Warr. Nov. Zool. xi. p. 502, and I suspect in the type of the genus, it is free.

Hydata propinqua, sp. n.

♂. 24 mm.—Face white, mixed with ochreous above; antenna white, tinged with ochreous; palpus ochreous, terminal joint paler, whitish above. Fore wing, as in congeners, pale translucent green with strong iridescent reflections; costa pale ochreous; some very faint reddish-grey shading at base discernible by reason of its less transparency; a moderate cell-spot; a very indistinct purple-grey apical cloud (opaque and distinct when the insect is held against the light), its proximal margin running from two-thirds costa a little oblique and irregularly to M^1, where the blotch abruptly terminates; spots of the ground-colour reappearing on costa just before apex and on termen (lunulate-margined) from R^1 to R^3; transverse lines obsolete. Hind wing from base to near distal margin reddish grey; a large, ill-defined purple-grey patch (or broad band) from inner margin (occupying slightly more than its middle one-third), narrowing somewhat, and becoming obsolescent before costa; faint traces of a second, narrower grey band from inner margin to the tooth at end of R^1, separating off a narrow green terminal area; apical margin, from C to R^1, also narrowly green; a very indistinct cell-spot. Underside similar, but with the markings still fainter; the apical cloud of fore wing and the median area of hind wing grey, not yellow as in *H. popayanaria*, Dogn. Ann. Soc. Ent. Belg. xlv. p. 310.

Huancabamba, Cerro del Pasco, E. Peru.

Very near to *H. popayanaria*, Dogn., but with a more definite apical blotch, and with the markings on the underside differently coloured.

Prohydata projiciens, sp. n.

♂. 25–28 mm.—Face pale ochreous, slightly deeper coloured above. Vertex white. Palpus ochreous, paler beneath, terminal joint pale. Antenna whitish ochreous, the shaft in part white. Fore wing with costa narrowly ochreous, otherwise pale translucent green, feebly marked with leaden grey, the markings consisting of: a basal patch, extending along inner margin to at least one-third, its anterior edge quitting costa at extreme base and irregularly oblique to inner margin; antemedian and postmedian lines scarcely visible except at inner margin, where they form diffuse grey spots with a tendency to coalesce; the antemedian from about one-third costa, apparently nearly straight; the postmedian from about two-thirds costa, strongly repandate after M^2, reaching inner margin near the antemedian; an elongate discal spot; a cloud from apex to M^1, its proximal edge from SC^4 at about 4 mm. before apex nearly parallel with termen (weakly concave) as far as R^3, thence turning towards termen, but sinuous; very faint traces of a line from this cloud to inner margin, enlarged into a spot on submedian fold; the apical cloud encloses an elongate subterminal patch of the ground-colour between SC^4 and SC^5, and three terminal ones, separated only by the veins, from SC^5 to R^3, the anterior one being short, the posterior triangular, the grey colour running to the termen at R^3. Hind wing almost entirely clouded with leaden grey, leaving the margin green from apex to R^3 and again from M^1 to tornus, and with the faintest possible indications of a diffuse greenish postmedian line or shade; cell-spot black, distinct, somewhat elongate. Underside without distinct markings.

San Antonio, W. Colombia, 5800 feet (*M. G. Palmer*); 2 ♂ ♂, the type dated December 1907, the other November 1907.

Similarly marked to *P. apicata*, Schaus, Tr. Am. Ent. Soc. xxvii. p. 251, which I select as type of the genus, but larger and with some other differences. Schaus in defining his genus gives "Palpi porrect, *short*"; I do not think this is applicable to any species of the group, though the palpus is much shorter in the ♂ (from which Schaus evidently diagnosed) than in the ♀, in which the third joint is extremely elongated.

Racheospila tumefacta, sp. n.

♂. 23–25 mm.—Face above red, below white, more or less marked with red, vertex white, occiput red; palpus red, first and second joints white beneath, third joint tipped with white; antennal shaft white, pectinations pale ochreous. Thorax green above, white beneath; legs white, marked with red. Abdomen whitish beneath, purple-red above, with five snow-white medio-dorsal tufts, the middle three large, subtriangular. Wings somewhat translucent green, finely irrorated with white, costa of fore wing white from near base to about two-thirds. Transverse lines whitish, fairly distinct in fine specimens; first sinuate, from one-fourth costa to one-third inner margin of fore wing, continued on hind wing; second from near three-fourths costa, lunulate-dentate (the teeth directed distad on the veins, the deepest lunule between M^2 and SM^2), reaching inner margin of fore wing at about two-thirds, continued on hind wing with a projection between R^3 and M^1. Fore wing with purple-red markings as follow: a streak along costa, projecting a lunular mark which bounds the second line proximally from SC^5 to R^1; an almost angular cell-spot, filled in distally with lighter purple-red shading, forming an irregular triangle; and a streak along distal margin, widening into conspicuous blotches from R^1

to R^3 and from tornus to above M^2, besides slighter angled projection between M^1 and M^2 and a still slighter between R^3 and M^1. Hind wing with purple-red markings as follow: an elongate discal spot; a narrow inner-marginal streak, which usually throws out some projections to submedian fold; and a border extended into blotches at apex and tornus. Terminal markings of both wings narrowly dark-edged proximally, and separated from the green ground-colour by a yellow line. Fringes paler purplish, darker marked at the vein-ends. Underside paler, whitish lines obsolete, discal spot of fore wing not filled in with purple-reddish, that of hind wing obsolete; otherwise marked as above.

Torné, Colombia, August 1907, type and three other ♂♂; El Congo, Colombia, July 1907, two ♂♂; San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*). Variation extremely slight. May well be a local race of *R. dependens*, Warr. Nov. Zool. xi. p. 25, differing in the large marginal blotches; *dependens* has *no* blotch at the radials. From *gerularia*, Hübn. (=*ocellata* Stoll, nec Linn.), and the species which I identify as *decorata*, Warr. Nov. Zool. viii. p. 449 *, *tumefacta* differs in the possession of the broad purple-red costal streak.

Rachcospila psittacina, sp. n.

♂. 34 mm.—Face red-brown, narrowly green above; vertex white; occiput apple-green; palpus varied above (red-brown, dark grey, and white), first joint below white, second blackish grey. Antenna ochreous, basal one-third of shaft white above. Thorax apple green above, white beneath; abdomen dorsally red-brown, with two snow-white spots, the posterior the larger and more triangular. Wings with termen scarcely sinuate. Fore wing apple-green, with costa narrowly yellowish white; markings purple-brown, consisting of a rather large rounded discal spot (slightly paler in centre), two roundish marginal blotches formed as in *R. lafayaria*, Dogn. Le Nat. 1892, p. 206, and a terminal line between them, thickening slightly towards each blotch; the blotches narrowly margined with yellow proximally; fringe purple-brown. Hind wing similar, but with discal spot quite small, costa not white, inner margin very narrowly red-brown. Under surface similar, rather paler, the yellow more diffuse; costa of fore wing more yellow, inner margin of hind wing not red.

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* The type is in bad condition.

brown; discal spot of fore wing smaller, of hind wing scarcely indicated.

Huancabamba, Cerro del Pasco, E. Peru (type); also a ♂ in Coll. Br. Mus., from Rio Janeiro, labelled *psittacina* by Warren (ined.).

Extremely close to *R. lafayaria*, Dogn. Le Nat. 1892, p. 206, but differing in shade of colour, bright yellow margins of blotches, and some other details, which satisfy M. Dognin that it is a separate species.

XENOPEPLA (Warr., indescr.), gen. nov.

Face smooth. Palpus (♂) moderate, porrect, rather long-scaled; third joint small, concealed. Antenna (♂) bipectinate with long branches (apices broken). Pectus and fore femur somewhat hairy; hind tibia (♂) dilated with hair-pencil, all spurs well developed, tibial epiphysis prolonged into a process about one-third the length of tarsus, which is not abbreviated. Abdomen not crested. Fore wing rather elongate, costa gently arched, apex moderate, termen entire, nearly straight in anterior half, then suddenly oblique, hence appearing gibbous at R^3 and M^1, though not angled; cell fully one-half, DC incurved, SC^1 (in the type species) anastomosing shortly with C, SC^{2,5,3,4} stalked, connate with R^1; R^2 from above middle, M^1 connate with R^3. Hind wing without costal dilatation at base, frenulum developed; apex rounded, termen deeply sinuate from R^1 to R^3 and more weakly from M^1 to tornus, toothed at R^3, tornus well pronounced; cell one-half, DC slightly curved; C anastomosing with SC at a point near base, then rapidly diverging, SC^2 stalked with R^1, R^2 considerably above middle, M^1 stalked with R^3.

Type of the genus: *Xenopepla bicuneata*, sp. n.

Xenopepla bicuneata, sp. n.

♂. 23 mm.—Head, body, and legs uniform dark fuscous. Wings dark fuscous, with an indistinct paler line (not yellowish, as in *flavinigra*, Warr.) near to and parallel with distal margins. Fore wing in addition with two rather large, broadly wedge-shaped, yellow markings midway between cell and termen, separated by R^2, their narrower ends pointing basad. Hind wing with a yellow central blotch from costa to R^3, enclosing, near its proximal margin, the thick elongate fuscous cell-spot; a small yellow spot between this blotch and inner margin; spots beyond cell as in fore wing, but shorter; a very small yellow spot below the distal end of these between R^3 and M^1. Underside similar, on the hind wing with the yellow markings slightly more extended and costal margin (to vein C) yellow from close to base almost to the central blotch.

El Congo, Colombia, July 1907; one ♂.

Clearly related to *Xenopepla* (nom. indescr.) *flavinigra*, Warr. Nov. Zool. xiv. p. 210, but apart from the fact that the yellow markings are somewhat lighter (less golden-yellow) on both surfaces and the arrangement of the pattern not quite the same there are several slight structural differences; in *flavinigra* SC^1 of fore wing does not anastomose with C, though briefly approximated, R^1 is stalked (though very shortly) with SC^{2-5}, M^1 just separate from R^3, M^1 of hind wing connate with R^3, not stalked; in *flavinigra*, too, the margins of the wings are slightly crenulate—those of the fringe more strongly so, but as the fringes are lost in *bicuneata* no comparison is here possible.

Subfam. *ACIDALIINÆ*.

Tribe CYLLOPODICÆ.

Cyllopoda isthmica, sp. n.

♂. 38 mm.—Face black, narrowly white laterally. Head and thorax black; abdomen fuscous above, whitish below, narrowly marked with yellow laterally; base of tegulæ laterally yellow. Fore wing golden-yellow; this ground-colour forms two large blotches, one semi-elliptical on inner margin from close to base to shortly before anal angle, touching median vein above, the other broadly oval with the two sides flattened and parallel, reaching from SC^2 to submedian fold; costal and distal margins black; the bar between the yellow blotches very narrow; fringe black, finely white at apex. Hind wing yellow, with a narrow black border ending in a point on costa before apex and at tornus. Underside similar, but with a fine white dash at apex of fore-wing before the white fringe.

Peru; one ♂ (type) received from Staudinger.

Belongs to the group of *cyrene*, Druce, Proc. Zool. Soc. 1885, p. 529, the areole being double, the antenna (♂) with fascicles of cilia. Mr. Warren calls some of this section *Atyriodes*, but the species which he made the type of

Atyriodes (*approximans*, Walk.) has simple areole and pectinate antenna. Typical *Cyllopoda* has also pectinate antenna, and if antennal distinctions are in this group generic, a revision will be necessary.

Tribe ACIDALIICÆ.

Anisodes rubrannulata, sp. n.

♂. 30 mm.—Closely similar in build, colour, and markings to *A. æqualipunctata*, Dogn. Ann. Soc. Ent. Belg. xlv. p. 176, but differing in the following points: abdomen without dorsal series of black dots, which is distinct in that species; fore wing with the discal ring scarcely at all mixed with black scales, hence of a much brighter red than in *æqualipunctata*; hind wing with the discal spot entirely black, not white-centred; both wings with the median shade (which touches the discal spots) simple, not geminate, and with the pale subterminal less strongly lunulate-dentate, the shading which precedes it less interrupted, and not darkened into two conspicuous spots between the radials, as in Dognin's species; underside showing the same differences in the median, the subterminal, &c., and, moreover, with all the markings, except the black cell-spots, of a deep carnation shade, not grey.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂.

Anisodes parcisquamata, sp. n.

♂. 34 mm.—Face brown above, whitish below; palpus bone-colour; head, thorax, and abdomen concolorous with wings; the first four dorsal segments of abdomen each with a distinct black-brown spot. Antennal pectinations long. Hind tibia with three spurs. Fore wing pale pinkish brown, with very faint and fine darker dusting; inner line marked by the usual three black vein-dots, with an additional dot beyond in cell, and another basewards above SC; the other lines oblique; median very faintly reddish, lunulate-dentate, plainer below middle, preceded by the round black cell-spot with a pale central dot; postmedian nearer termen than usual, very faint, marked by black teeth on the veins; subterminal close to postmedian, indicated by a slight dark shade on costa containing a black dot above SC^5, and by two elongate black spots between the radials; large black terminal spots between, and minute black dots at the ends of the veins; fringe concolorous. Hind wing with a black spot at base; inner line marked by black dots on M and SM^2; cell-spot as in fore wing; a reddish median line from it to inner margin, where it is marked with black; postmedian and subterminal as in fore wing, but instead of the costal shade the subterminal is marked by coalescent black spots on veins at inner margin. Underside duller, marked like upper; fore wing with base diffusely dark grey, costa towards apex olive-brownish; subterminal interruptedly blackish.

Huancabamba, Cerro del Pasco, E. Peru; one ♂.

Allied in shape and markings to the group containing *bipartita*, Warr. Nov. Zool. vii. p. 141, but the termen of hind wing is more strongly toothed at R^3 than in that species.

Anisodes renistigma, sp. n.

♂. 28 mm.—Head, thorax, and abdomen concolorous with wings; antennal shaft spotted with rosy purple; upper edge of palpus rosy purple; abdomen dorsally with two small purple spots, at base of third and fourth segments. Hind tibia hairy, with terminal spurs only. Wings broad, termen (especially of hind wing) well crenulate. Fore wing ochreous, slightly tinged with pale brown and with numerous fine grey and purple speckles; black vein-dots near base indicating a subbasal line; antemedian pale brown, lunulate-dentate, the teeth marked by black points on veins; median more concise and brighter, lunulate-dentate, dark grey in costal third, followed by a diffuse brown shade; postmedian parallel to median, marked by black dots on the veins; subterminal pale between grey shades, the proximal marked by a blackish dot above SC^5 and below M^1 and black spots between the radials; terminal area thickly grey speckled; terminal black spots between veins and minute dots at their ends; cell-spot reniform, consisting of slightly raised pale lilac-grey scales outlined with dark. Hind wing with base and costal area paler; cell-spot larger, closely followed by a brown median line, which is nearly straight from inner margin to R^1, there angled; the rest as in fore wing. Underside pale straw-colour, without speckling except along costa of fore wing; all the lines thick, rosy purple.

Chanchamayo, E. Peru; one ♂.

Semæopus anfractata, sp. n.

♂. 36 mm.—Face and fore leg brown; palpus externally blackish; vertex, thorax, and abdomen concolorous with wings. Wings shaped nearly as in *indignaria*, Guen. (*Cnemodes*); fore wing weakly subfalcate. Bone-colour, finely dusted with grey. Fore wing with costal edge rufous; lines fine, of mixed brown and black scales, the black predominating in the submarginal; inner line oblique inwards, faintly curved below middle and angled on SC; outer sinuous, incurved on both folds, followed by a band of grey scales; a submarginal line zigzag, strongly dentate-lunulate, the teeth in the two folds nearly reaching the grey band; terminal area beyond densely grey-dusted; terminal line very slender; fringe concolorous; cell-mark linear, blackish. Hind wing with cell-mark oval, whitish grey with black edges; median line brownish, less regularly waved, with a fine grey line beyond it; a submarginal line as in fore wing, but with the tooth on SC^2 strongly produced basewards.

Sapucay, Paraguay, 14 July, 1903 (*W. Foster*); one ♂.

Belongs presumably to the *Cnemodes* section of the genus, the antennal pectinations being as in *indignaria*, Guen. The hind-tibial scent-organs are much less developed, wanting the felt-like and red-coloured masses which in that species replace tibia and tarsus, and consisting merely of a single long brush reaching about to the end of the tarsus, which is short, but not aborted; on the other hand, the middle leg is furnished with a felt-like lappet and short hair-tuft at the femoro-tibial joint, and with dense masses of long hair on the tibia. The only other species known to me which presents this structure is *Semæopus vacuata* (Warr.) *, also from Sapucay; it is not impossible that *anfractata* may prove an extraordinary aberration of that species.

Hamalia flavida, sp. n.

♂: 24 mm.—Head, thorax, and abdomen concolorous with wings; palpus externally and at tip reddish; venter and legs yellow, fore leg tinged with purple. Fore wing dull yellow sprinkled with red scales; the lines purplish brown; antemedian from one-fifth costa, vertical below an angle on SC; median thick, slightly outbent and touching the cell-mark externally, bent on M^2 and thence more oblique to before middle of inner margin; postmedian oblique outwards to termen at R^3, thence forming terminal lunules to anal angle; a broad diffuse oblique streak from base of costa to anal angle; marginal line purple; fringe dull yellow chequered with purplish; cell-mark of slightly raised scales, white, linear, dark-margined. Hind wing more thickly sprinkled with reddish scales; cell-mark as in fore wing; a dark purplish mark at base, a median line just beyond cell-mark; the outer line showing only at costa and in the terminal lunules below middle. Underside yellow flushed with dull red; the lines slightly marked.

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* *Cnemodes viridiplaga* ab. *vacuata*, Warr. Nov. Zool. xiv. p. 216; I have not been able to examine Walker's *viridiplaga* since my attention was directed to the structural peculiarities.

Huancabamba, N.E. Peru, 5000–6400 feet, January 1906; one ♂. M. Dognin possesses a precisely similar but smaller example from French Guiana.

Close to *H. divaricata*, Warr. Nov. Zool. iv. p. 439 (*Lipomelia*), but at once distinguished by its *yellow* ground-colour and oblique longitudinal streak.

Warren's genus *Lipomelia* was erected for the Indian species *subusta*, Warr., with simple areole. Whether some slight character will ultimately be found whereby to separate his American "*Lipomelia*" (with double areole) from *Hamalia*, Hübn., I am not at the moment prepared to say. In the present species SC^2 of fore wing arises from the cell, anastomoses at a point with SC^1 and then very lengthily with SC^{3-4} from shortly before the departure of SC^5; SC^2 of hind wing is connate or barely stalked with R^1.

Hamalia parallela, sp. n.

♂. 21–23 mm.—Face and collar dark brown; vertex and base of antennal shaft white; thorax and abdomen pale ochreous. Fore wing pale ochreous tinged with pale sandy brownish; costal edge purple-brown to middle and brown-speckled above SC; lines pale brown, indented on submedian fold; antemedian nearly vertical, slightly outcurved from costa to fold; median and postmedian parallel to each other throughout, incurved on both folds, the postmedian lunulate-dentate, with the teeth short and pointing basewards; subterminal line pale, wavy, between two interrupted bands of sandy brown; veins brownish towards termen; terminal line blackish, interrupted by the pale veins and somewhat swollen between; fringe ochreous, with a paler line at base; cell-spot small and dark. Hind wing somewhat paler, less tinged with brownish; without the inner line; termen bluntly bent at R^1. Underside yellowish ochreous, with the lines showing through; fore wing with basal third of costa broadly brown.

Sapucay, Paraguay (*W. Foster*); several ♂ ♂ in Coll. L. B. Prout and Coll. Brit. Mus.

Much resembles *botydata*, Walk. List Lep. Ins. xxii.

p. 727, *immunda*, Dogn. Ann. Soc. Ent. Belg. lii. p. 266, and *reducta*, Dogn., *ibid.*, distinguished by the two parallel outer lines; from *botydata* also by its more ochreous tone, less sharp markings, more interrupted terminal line, and absence of distinct dark spots in the fringe; Dognin's species I do not possess for more detailed comparison.

EUPTYCHOPODA, gen. nov.

Face smooth. Palpus small. Tongue present. Antenna in ♀ subserrate, very shortly ciliated. Hind tibia in ♂ almost certainly aborted and without spurs, as in *Euacidalia*, in ♀ with one long median spur and a pair of unequal terminal. Wings long and narrow. Termen of fore wing entire, or very slightly sinuate towards tornus; of hind wing strongly toothed at the vein-ends, with rounded incisions between, the tooth at M^1 the strongest. Fore wing with cell one-half, SC^1 from cell, anastomosing with the stalk of SC$^{2-5}$ to form a single areole; M^1 separate from R^3; M^2 from near M^1. Hind wing with C anastomosing at a point with SC or connected by an extremely short bar, thence *gradually* diverging, SC^2 stalked with R^1, M^1 separate from R^3; M^2 from near M^1.

Type of the genus: *Euptychopoda yponomeutaria* (Guen.) = *Acidalia yponomeutaria*, Guen.

Aspect of *Euacidalia*, Pack. 5th Rep. Peab. Ac. Sci. p. 69, with which it has hitherto been confounded; differing in the simple areole, in the more sharply dentate margin of the hind wing (suggesting a transition to the curious genus *Odontoptila*, Warr. Nov. Zool. iv. p. 440), and in the tibial armature of the ♀, *Euacidalia* wanting the median spur. The areole, however, is possibly inconstant in this genus, as I have seen an unnamed species from Brazil and Paraguay, extremely similar to *E. caudata*, and with the same tibial armature, which has the areole double.

Euptychopoda caudata, sp. n.

♀. 19 mm.—Face dark fuscous. Head and body concolorous with wings. Fore wing whitish ashy, speckled with fuscous atoms, the terminal area from postmedian darker; a fuscous spot on costa before one-third, and another on SC very obliquely beyond it, antemedian line otherwise obsolete; a rather weak median line following the small dark cell-spot, starting from a dark spot on costa and running parallel with termen, but slightly outcurved near costa; postmedian from just before three-fourths costa, commencing with a dark dash and consisting of a series of dark vein-dots parallel with termen; subterminal line whitish ashy, rather thick, forming a double indentation below costa, another behind cell, and a third (less distinctly double) between M^2 and SM^2. Hind wing similarly coloured, the cell-spot diffuse, the lines obsolescent. Underside similarly marked, but much more weakly, the markings (especially on fore wing) being partly obliterated by an increased dark suffusion.

Bartica, British Guiana (*W. J. Kaye*), type; a second ♀ from Pará, May 1898 (*J. Trumbull*), in Coll. Brit. Mus.

Very similar to *E. yponomeutaria* (Guen.) from the West Indies, but readily distinguished as follows:—hind wing, at least in ♀ (♂ unknown), more acutely toothed at M^1; fore wing with postmedian line much straighter (in *yponomeutaria* it is angled outwards on R^1, and bends inwards beneath the cell), subterminal somewhat more irregular, terminal line more continuous (in *yponomeutaria* it consists of a series of roundish dots between the veins), fringe rather more strongly spotted.

Acidalia atridiscata (Warr.), ab. *obsoleta*, nov. ab.

♂. Differs from the type (*Hæmalea atridiscata*, Warr. Nov. Zool. xi. p. 37) in the entire obsolescence of the characteristic black discal mark, the position of the discocellulars being merely indicated very faintly by an elongate light brown mark. Termen of hind wing very slightly bent at R^3, which is not perceptible in any *vinocinctata* that I have seen, nor in the figure of *atridiscata* which I have before me.

San Antonio, W. Colombia, 5800 feet, November 1907 (*M. G. Palmer*); one ♂.

Mr. Warren is strongly inclined to regard *atridiscata* (described from Peru) as a form of *vinocinctata*, Guen. The alliance is certainly very close, but I think they should be kept distinct. I have not been able to study much material, but in any case the antenna of my ab. *obsoleta* is more strongly dentate than in the Brazilian *vinocinctata*, the fascicles of cilia apparently somewhat longer and stronger. It is not unlikely that *obsoleta* may prove specifically distinct from both the others, or at least a constant local race.

I find in this species no structural differences from *Acidalia* (= *Craspedia*, Hmpsn. = *Emmiltis*, Warr.), the slightly more pointed fore wing certainly not being generic.

Homalia, Hüb., to which Warren refers it, has the areole double; usually, also, SC^2 and R^1 of the hind wing stalked; neither is the case with *vinocinctata* and *atridiscata*.

Subfam. *LARENTIINÆ.*

Amaurinia serrilineata, sp. n.

♂. 28 mm.—Face deep fulvous, mixed with purple-brown; vertex and antennal shaft snow-white; head, thorax, and dorsum brownish fulvous; venter, legs, and anal tufts yellowish. Fore wing deep yellow, irregularly suffused with fulvous and purple-brown except a triangular apical space; the extreme termen above and below middle pale lemon-yellow; the lines diffusely brown; indistinct across the paler apical space, where they are seen to be distinctly serrate; cell-spot cloudily blackish, the costa above it darker; the purple-brown suffusion reaches to termen between R^3 and M^1, and at the ends of these veins darkens the fringe, which is elsewhere pale yellow. Hind wing suffused with purple-brown and fulvous, darkest at base, crossed by indistinct lines, its edge distinctly dentate and not reaching termen at middle, the termen narrowly yellow throughout; fringe yellow. Underside of fore wing leaden grey, the costal area dull fulvous; apex and termen very pale yellow; hind wing paler with the lines thick and more distinct, the termen very pale yellow.

Huancabamba, N.E. Peru, 5000–6000 feet, January 1906; one ♂.

The termen of both wings is slightly more gibbous in the middle than in the following species. Both have the costa of the hind wing relatively short, termen and inner margin long, tornus therefore produced, but in neither is the termen angled at R^3, as in some of the genus.

Amaurinia cellulata, sp. n.

♂. 28 mm.—Face, collar, and prothorax dull fulvous; vertex and antennal shaft white; abdomen grey, tinged with fulvous, especially towards base. Fore wing dull lavender-grey, the costal area and cell dull fulvous; cell-spot black, distinct; lines thick and wavy, very indistinct, except above the middle, three before and three beyond the cell-spot; termen narrowly pale yellow, the grey ground-colour a little deeper before it and slightly projecting between R^3 and M^1; fringe yellow (defective). Hind wing narrowly dull fulvous at base only, limited by a dark line;

another curved thick line just beyond middle; fainter lines on each side of it; the grey area is more broadly darkened before the yellow margin, and distinctly crenulate. Underside duller.

Huancabamba, N.E. Peru, 5000–6000 feet, January 1906; one ♂.

Amaurinia fulva, sp. n.

♂ ♀. 25 mm.—Face dark fulvous; fillet snow-white; head, thorax, and abdomen greyish fulvous. Fore wing bright pale fulvous, the basal area and costal region suffused with dull rufous brown; the lines dark brown, outcurved and waved, slightly bent below costa and below middle, at nearly even distances apart on costa, but the postmedian approaching median below middle; a dark brown linear cell-spot just beyond antemedian line; terminal line dark brown; fringe dull yellow. Hind wing with two brown lines, the inner very faintly curved, nearly straight, the outer at or slightly beyond middle of wing; angled or strongly bent on M^1; terminal area with three or four very faint darker wavy lines, which are still more obscure on fore wing. Underside much paler, especially on hind wing; the lines reddish grey and wavy, the subterminal more distinct.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*), the type ♂; also two other ♂ ♂, December, and one ♀, November; all from the same locality.

The termen of fore wing is slightly gibbous between R^3 and M^1, oblique below, and faintly concave above; of hind wing bluntly angled. Allied to *A. bifilata*, Warr. Nov. Zool. ii. p. 103 (*Cambogia ?*). Some specimens are slightly darker and more purplish-tinged than the type.

[To be continued.]

BIBLIOGRAPHICAL NOTICE.

A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution. A Text-book for Students and Collectors. By J. W. Tutt, F.E.S. Vol. III. 8vo. London, 1908–09. Pp. viii, 410; pls. 53. Price £1.

We have received another instalment of Mr. Tutt's enormously elaborate work on British Lepidoptera, being the tenth of the whole series. The amount of matter it contains is far more than the appearance of the outside of the book might indicate, for it is so closely printed that the average number of words on a page seems to be somewhere about 650.

The first part of the present volume, comprising 40 pages, is devoted to Family Habits in Butterfly Larvæ,—the Chrysophanids, the Urbicolids, and the Papilionids, and coordinates a great amount of scattered information relative to exotic as well as to British species. The second part of this volume, comprising 358 pages, is devoted to five species only of our British "Blues"—*Everes argiades*, *Cupido minimus*, *Plebeius argus* (*ægon*), *Cyaniris semiargus*, and *Agriades thetis* (*bellargus*). The remainder of the volume is taken up by errata, index, &c.

As an illustration of the thoroughness of Mr. Tutt's work, we may analyze the fifty pages devoted to *Cupido minimus*, Fuessly (*alsus* Fabr.), the Bedford Blue. First we have nearly a page of synonymy of the genus *Cupido*, a translation of Schrank's analysis of his subdivisions, and a discussion on the real type. Then follows a page of synonymy of the species; the original description; paragraphs on Sexual Dimorphism, Variation, followed by full descriptions and critical remarks on 12 named varieties; among them being *lorquinii* of Herrich-Schäffer, which Mr. Tutt is inclined to regard as probably a distinct species. Next we have sections on Egg-laying, Ovum, Habits of Larva, Variation of Larva, Food-plants, Parasites, Puparium, and Pupa. Finally, we have sections dealing with Times of Appearance throughout the range of the species, Habits, Habitats, British Localities, and Distribution.

The structure and development of the larva is treated of in very great detail, and illustrated by 9 plates, several containing two sections; another plate being devoted to beautiful photographic figures of the butterfly at rest in various positions, likewise of the larvæ and the under surface of the butterfly, and a pupa-skin of *Everes argiades*.

The other species dealt with in this volume are discussed in an equally elaborate manner, including *Everes argiades*, just mentioned, which Mr. Tutt regards as only doubtfully British.

Although the bulk of the illustrations deal with the earlier stages of the insects, several are devoted to perfect insects, especially plate 4, exhibiting varieties of *Everes argiades*, *Cupido minimus*, and *Plebeius argus*; plate 5, showing *Everes argiades*, with varieties and allied species; and plate 42, which, with the exception of a few figures devoted to *Cyaniris semiargus*, is entirely devoted to a wonderful series of aberrations of *Agriades thetis*.

We hope that Mr. Tutt may live to bring out many more volumes of a book which is quite as important to the general student of Lepidoptera as to the entomologist who confines his attention exclusively to British species. W. F. K.

THE ANNALS

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XXVIII.—*A Survey of the South-African* Stenogyrinæ, *with Descriptions of several new Species.* By M. CONNOLLY.

[Plate VI.]

EVER since Krauss, in 1848, described, under the names of *Bulimus turriformis* and *B. linearis*, specimens of shells brought by J. A. Wahlberg from Natal and Mt. Mohapaani respectively, there has existed some confusion regarding them, which has rendered difficult the task of differentiating between them and other closely allied members of their family which abound over a great part of the Dark Continent.

Both Krauss's descriptions can be and have been applied by different authorities to totally different species from widely divergent localities, while his figures do not sufficiently bring out the details lacking in his descriptions.

Thanks to the courtesy of Dr. Sigalmar Théel, of the Royal Academy of Stockholm, I have been privileged to examine original specimens collected by Wahlberg and determined by Dr. Krauss. The results are of considerable importance, and would alone justify the appearance of a paper on the subject.

The determination of Krauss's species leaves without names several forms, some of which have been long known to collectors, but more or less inappropriately referred by them to *turriformis* or *linearis*. By the classification of some of these forms I hope to do something towards unravelling the tangle that has existed with regard to them, and has made the arrangement of Stenogyrinæ one of the most difficult branches of South-African conchology.

A difficulty presenting itself at the outset is that of deciding how much latitude can be allowed for local and individual variation. As Dr. Pilsbry points out, some members of the family are peculiarly subject to dimorphism, two forms of the same shell, a slender and a stouter, with intermediate degrees, all other features remaining the same, often coexisting in the same locality. It is therefore obviously impossible to attach much importance to mere difference in the breadth of two shells, although it may entirely alter their general relative appearance. It must also be borne in mind that the live shell of nearly every South-African Stenogyroid in good condition is normally very pale bluish green (olivaceous) in colour, very thin, nearly transparent, with a bright gloss that varies from a high polish in the smoother species to a duller silky sheen when the sculpture is sufficiently pronounced to ridge, ever so slightly, the smoothness of the shell. Even live specimens, if exposed to climatic influence, are apt to lose their gloss and transparency and take on a general yellowish tinge, often before maturity, while dead shells soon become white and opaque, losing whatever gloss they originally possessed. Good live specimens, too, are often so affected by immersion in spirit as to lose much of their translucency, and become blotched with creamy stripes or stains.

Differences of the above nature, then, can only be regarded as of a certain minor relative importance; and the question remains, how much notice must be taken, in the division of the species, of the nature of their epidermis and sculpture, breadth of apex, shape and number of whorls, amount of perforation, and size and shape of aperture. With the exception of the last-mentioned, these points will be found to remain almost constant in even a large colony of most species under discussion, and to vary comparatively little in shells, attributable to the same species, gathered from widely different parts of the country; it is therefore from a close study of these details in particular that my inferences have been drawn.

In following the classification adopted by Dr. H. A. Pilsbry in his 'Manual of Conchology,' vol. xviii., I may point out that that author admits that the reference of certain species to one or other genus has been in many instances purely arbitrary. Some forms undoubtedly appear to be wrongly placed at present; but while so much uncertainty exists regarding the habits and anatomy of many of the animals, I think it inadvisable to further complicate matters by a possibly erroneous reclassification.

In the following notes, every shell of which I have counted the whorls and taken the measurements has been so dealt with lying flat on its back, aperture upwards. The very important measurement which I call length of last whorl is that taken from the extreme base of the aperture to the centre of the suture immediately above it.

I have usually taken as type the largest specimen available. Nearly all Stenogyrinæ begin to reproduce before attaining full size, though, as a general rule, the presence of eggs in the ovary may be taken as proof that the shell is at least two-thirds grown. Some species, however, certainly begin to reproduce before their shells attain half the size of typically large specimens. Whether these individuals would, in ordinary course, continue growth to large dimensions, or whether their growth at the time of reproduction is almost completed, has not, I believe, yet been determined.

In the present survey I have taken as my northern geographical limit the Tropic of Capricorn, thus excluding the genus *Subulina*, which is a tropical rather than a South-African form.

With the exception of *Euonyma unicornis*, the types of all the new species have been presented by Messrs. Ponsonby, Farquhar, or myself to the British Museum.

REFERENCE LIST, WITH NOTES.

Family **Achatinidæ**.

Subfamily *STENOGYRINÆ*.

Genus EUONYMA, M. & P., 1906.

(Ann. & Mag. Nat. Hist. xviii. p. 316.)

Proposed by Melvill and Ponsonby for the sinistral form *lævocochlis*, and extended by Pilsbry to embrace the South-African group of "rather large, slender Stenogyroid snails" which he considers to differ from *Opeas* chiefly in their larger size and general aspect, and to be kept separate from *Stenogyra* solely by the diverse geographical distribution, *Stenogyra* in the restricted sense comprising only tropical American species.

It rests with some future student of anatomy to decide

whether *Euonyma* can stand. As at present constituted, it very possibly comprises representatives of three different genera; but, for reasons previously mentioned, I adhere to Pilsbry's arrangement of the genus, and at the same time place therein, provisionally, several forms hitherto undescribed, which, though nearly allied to *Opeas*, exceed it in average size.

1. *Euonyma linearis* (Krauss). (Pl. VI. fig. 4.)

1848. ***Bulimus linearis***, Krs. Die südafr. Molluskeu, p. 78, pl. v. fig. 3.
1848. ***Bulimus linearis***, Krs., Pfr. Mon. Hel. Viv. ii. p. 157.
*1850. ***Bulimus linearis***, Krs., Reeve, Conch. Icon. v. fig. 648.
1845–55. ***Bulimus linearis***, Krs. Conchyl. Cab. i. p. 257, pl. lxix. figs. 15–17.
*1880. ***Bulimus linearis***, Krs., Craven, Proc. Zool. Soc. p. 616.
1881. ***Stenogyra (Opeas) linearis***, Krs., Pfr. Nomencl. Hel. Viv. p. 321.
*1889. ***Bulimus linearis***, Krs., Morelet, Journ. de Conch. xxxvii. p. 19.
1898. ***Subulina linearis***, Krs., M. & P. Proc. Mal. Soc. iii. p. 179.
*1898. ***Opeas lineare***, Krs., Sturany, Südafr. Moll. p. 61 (reprint).
1906. ***Euonyma linearis***, Krs., Pilsbry, Man. of Conch. xviii. p. 44, pl. x. figs. 79, 80.

As the proper understanding of this species and its distribution is of importance, I append in tabular form (*a*) Krauss's description of the type and (*b*) Pfeiffer's of the shells in Krauss's collection:—

(*a*)	(*b*)
B. Testa subrimata,	Testa subperforata,
turrito-subulata,	turrito subulata,
tenui,	solidula,
nitidula,	vix nitidula,
cornea,	corneo straminea,
subtilissime striata ;	arcuatim striatula ;
spira elongata, apice acutiuscula ;	apice acutiuscula ;
anfractibus 10, subplanis,	anfr. 10, convexiusculi,
ultimo ¼ longitudinis æquante ;	ultimus ¼ longitudinis subæquans ;
	basi rotundatus ;
columella stricta ;	columella recta, subverticalis ;
apertura ovali ;	apertura elliptica, utrinque attenuata ;
peristomate simplice, acuto ;	peristoma simplex, rectum ;
margine dextro arcuato ;	margine dextro antrorsum dilatato ;
columellari breviter reflexo, basi appresso.	columellari reflexo, perforationem fere tegente.
Long. 5·8, diam. 1·8 lin. [*i. e.* long. 12·27, diam. 2·75 mm.].	Long. 13½ mill., diam. 3½. Ap. 8 long., medio 2 lata (Coll. Krs. spec. max.).
In monte Mohapaani ad flumen Limpopo ; legit J. A. Wahlberg.	Hab. in Monte Mohapaani, Afr. merid.

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* It is doubtful to what actual species these authors refer.

Krauss further remarks that *B. linearis* is near akin to *B. turriformis*, but "is much narrower and longer in proportion; almost cylindriform; plainly striated; has 10 whorls and a less elongated aperture. The striæ, which are only visible under a lens, and the outer lip are curved."

The cotype, kindly shown me by Dr. Théel, from the Stockholm Museum, is elongate, narrowly rimate, olivaceous, thin, almost transparent, not very glossy. Spire produced, very slowly tapering, outline a little swollen about the fifth whorl. Apex rounded. Whorls 8, somewhat convex, gradually increasing after the first, which is very small and rather mamillate; all except the first two plainly covered with fine, regular, curved striæ. Suture clearly defined, not at all filiform. Aperture ovate, rather flattened at base. Peristome simple, acute. Outer lip slightly curved outwards, arched forward. Columella straight, margin very narrowly flatly reflexed over the small rima, which it almost conceals.

Shell 11·2 mm. long., 3·0 lat.; aperture 3·3 × 1·3 mm.; last whorl 5 mm.

The shell is full of eggs.

A small species, which might be better placed in *Opeas*; clearly differing from *E. crystallina*, M. & P., of Natal in its duller texture, more convex whorls, and almost fusiform contour; while *E. pietersburgensis*, Preston, appears to have more convex whorls and a shorter aperture.

Unfortunately there exists some doubt as to the exact whereabouts of the sole locality quoted by Krauss and Pfeiffer for this species—Mount Mohapaani,—which Krauss describes as being "beyond the Quathlamba" (or Drakensberg); "on the R. Limpopo"; and "deep in the interior." The nearest modern equivalent to Krauss's name is Mopani or Mokoro, a station on the Buluwayo line just south of the Lotsani R., a tributary of the Limpopo, doubtless deriving its name from the quantities of the rather unjustly ill-famed mopani tree which abounds in the neighbourhood. Dr. Théel, however, very kindly informs me that "Wahlberg in his own journal writes Mount Mokopoani, alternating with Mokopaani," in which case its modern name appears more likely to be Makapan, occurring more than once in the district between Pretoria and Pietersburg, and including Makapanspoort, near Pietpotgietersrust, where a party of Boer vortrekkers were entrapped by the native chiefs Mapela and Makapan in 1852, and Hermans Potgieter, their leader, flayed alive after all his companions had been killed.

Whichever be the true habitat of *E. linearis*, it is in the highest degree unlikely to have spread from its northern fastness into Natal or Cape Colony, the more so as it has not yet been found in the intervening country. But owing to the lack of detail in Krauss's figure and the marked discrepancies between his and Pfeiffer's descriptions, it is hardly surprising to find that other shells, little resembling the original, from widely divergent districts, have been erroneously attributed, in museum and private collections, to *linearis*, and accepted by subsequent writers as typical of Krauss's species. Thus Reeve describes under this name a specimen in the Cuming collection as a "delicate glassy shell in which the suture is distinguished throughout by a fine elevated ridge" (an attribute only found, in South Africa, in *Hypolysia florentiæ*, M. & P.), and gives the rather mixed locality "Portnatal, South Africa (near the river Limpopo)." Sturany also refers to examples collected by Dr. Penther in Durban and Isipingo as having shiny surface and thread-like suture, neither of which exists in the cotype in the Stockholm Museum.

I have not seen the shells attributed to *linearis* by Craven from Winburg, O.R.C., or Lydenburg, Transvaal, but have looked through several series from many parts of Natal, Cape Colony, and Southern Transvaal, without finding anything to match the Stockholm cotype; and having regard to the foregoing geographical facts, I think it may be reasonably inferred that the specimens brought home by Wahlberg are possibly the only true examples of *E. linearis* yet known in Europe, and that all other records of its appearance have been made from specimens of *E. crystallina*, M. & P., *H. florentiæ*, M. & P., and possibly one or two other species, yet undescribed, each answering in more or less degree to Krauss's description and figure, but not agreeing with his type.

I may here add that Mr. E. L. Layard, in his manuscript notes, remarks: "*linearis*, Krauss, extends to Cape Town, where I have procured many specimens about damp places in gardens and yards, such as stones about a pump, on which water was continually dripping." It is impossible to say to what actual species Layard referred, but the note is of interest as the only record of the appearance of a *Stenogyra* in the Cape Peninsula, where nothing of the kind has been found in recent years.

2. *Euonyma pietersburgensis* (Preston).

1909. *Subulina pietersburgensis*, Preston, Ann. & Mag. Nat. Hist. iv. p. 499 (text-figure).

Hab. NORTHERN TRANSVAAL, Pietersburg (fid. *Preston*).

Not a *Subulina*. I place it provisionally in *Euonyma* on account of its kinship to *linearis*, from which it is apparently separable by its shorter aperture.

Euonyma pietersburgensis (Preston), var. *levis* (nov.). (Pl. VI. fig. 8.)

Shell elongate, narrow, turriform, subrimate, thin, glossy, transparent, pale olivaceous. Spire produced, acute, slowly and evenly tapering; apex rounded. Whorls 9½, gradually increasing; slightly convex; the first two smooth, the very fine curved striæ on the remainder being scarcely visible without a lens. Aperture short, almost oblong, rather flattened at the base. Peristome simple, acute. Outer lip nearly straight, very slightly arched forward and a little retracted towards the base. Columella straight, margin extremely narrowly reflexed, almost entirely adnate. Callus none.

Shell 12·4 × 3·0, aperture 3·1 × 1·3, last whorl 4·9 mm.

Hab. TRANSVAAL, Warmbaths, Pienaar's Poort, Pietpotgietersrust (*Connolly*); Zoutpansberg (*Cregoe*).

Smoother and more polished than typical *E. pietersburgensis*, but running into it through large series. Hardly so slender a form as *E. crystallina*, M. & P., with comparatively shorter broader aperture. More glossy and less markedly striate than *E. linearis*, Krs.

E. pietersburgensis and the smoother var. *levis* agree rather nearly with both the original figure and description of *E. linearis*; as, however, they certainly do not agree with the Stockholm cotype of the latter, they must for the present be considered distinct.

3. *Euonyma crystallina* (Melv. & Pons.).

1896. *Subulina crystallina*, M. & P. Ann. & Mag. Nat. Hist. xviii. p. 316, pl. xvi. fig. 4.
1898. *Subulina crystallina*, M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Opeas crystallinum*, M. & P., Sturany, Süd-Afr. Moll. p. 60.
1906. *Euonyma crystallina*, M. & P., Pilsbry, Man. of Conch. xviii. p. 45, pl. x. fig. 81.

Hab. Very widely distributed over Zululand, Natal, and the Eastern Province, Cape Colony.

A slender little shell, very near the narrow border-line between *Opeas* and *Euonyma*. Far smoother and more highly polished than *E. linearis*, with rather less convex whorls and more regularly tapering spire.

Extremes of form may be found to differ so far in certain details as almost to appear separate species, but careful comparison of larger series renders it impossible to regard them as other than varieties of the same. It is probable that all reported occurrences of *E. linearis*, Krs., in the south-eastern corner of the subcontinent are referable to the present species or to *Hypolysia florentiæ*, M. & P.

4. *Euonyma turriformis* (Krauss). (Pl. VI. fig. 1.)

1848. *Bulimus turriformis*, Krs. Die südafr. Mollusken, p. 78, pl. v. fig. 2.
1848. *Bulimus turriformis*, Krs., Pfr. Zeitschr. für Malak. p. 121.
1853. *Bulimus turriformis*, Krs., Pfr. Mon. Hel. Viv. iii. p. 392.
1880. *Bulimus* (*Stenogyra*) *turriformis*, Krs., Craven, P. Z. S. p. 615.
1881. *Stenogyra* (*Opeas*) *turriformis*, Krs., Pfr. Nomencl. Hel. Viv. p. 320.
1889. *Bulimus turriformis*, Krs., Morelet, Journ. de Conch. xxxvii. p. 19.
1898. *Opeas turriforme*, Krs., Sturany, Südafr. Moll. p. 60.
1898. *Subulina turriformis*, Krs., M. & P. Proc. Mal. Soc. iii. p. 179.
1899. *Opeas turriforme*, Krs., Stur. Denkschr. k. Akad. Wiss. Wien, lxvii. p. 596.
1906. *Euonyma turriformis*, Krs., Pilsbry, Man. of Conch. xviii p. 43, pl. x. figs. 77, 78.

Not *Bulimus turriformis*, Krs., Reeve, Conch. Icon. 1850, spec. 652, Mus. Cuming, which, perhaps, most resembles *E. lanceolata*, Pfr., juv.

Hab. NATAL (*Wahlberg*, fid. *Krauss*). Widely distributed over the Eastern Province, Cape Colony; Natal; and Zululand. Craven's loc., Lydenburg, Transvaal, is very doubtful.

Krauss's description runs :—"*B.* testa subrimata, elongato-turrita, tenui, nitida, cornea, sublævi; spira elongata, acutiuscula; anfractibus 9 convexiusculis, ultimo ⅓ longitudinis æquante; columella stricta; apertura oblongo-ovali; peristomate simplice, acuto, recto, margine columellari breviter reflexo, basi adnato. Long. 7,5, diam. 2,2 lin." (*i. e.* long. 15·87, lat. 4·65 mm.). "In terra natalense; legit J. A. Wahlberg."

The specimen kindly lent me by Dr. Théel is elongate, turriform, rimate, olivaceous, thin, only moderately glossy, semitransparent. Spire produced, acute, evenly tapering. Apex rounded. Whorls 9, gradually increasing; but little convex; the first two smooth, remainder faintly sculptured with fine, regular, close, curved striæ, hardly visible to the naked eye before the sixth whorl. Suture well defined, but not deep. Aperture almost elliptical, rounded at base. Peristome thin, simple. Outer lip hardly curved outwards (and doubtless would be slightly arched forwards in profile, but the present specimen is imperfect). Columella very slightly concave, margin triangularly reflexed over the rima.

Shell 15·6 × 4·2, aperture 4·6 × 1·75, last whorl 7·0 mm.

Hab. NATAL (*Wahlberg*).

The shell contains eggs. It agrees in form with Krauss's figure, and there is no reason to regard it as other than typical of *E. turriformis.* Much confusion has arisen with regard to this species, from the fact that it was described from shells which, though almost perhaps themselves mature, had hardly grown to half the proportions which the species is capable of attaining; Wahlberg's specimens, too, were of a more slender contour than generally occurs—facts which, combined with the use of the word "nitido" in the original description, have caused other forms to pass as typical of Krauss's species.

Now it appears obviously necessary to accept the Stockholm cotype as the basis on which to reconstruct the perplexing Natal *Euonymæ*; and, after allowing a margin for it to attain full proportions, remembering that it is a slender form of a species particularly subject to dimorphism, and taking into careful consideration its colour, form, texture, and sculpture, it seems that the two following, hitherto considered distinct species, should be regarded as at most varieties of *turriformis.*

Var. *acus* (Morelet). (Pl. VI. fig. 2.)

1880. *Stenogyra acus,* Morelet, Journ. de Conch. xxxvii. p. 8, pl. i. fig. 6.
1896. *Subulina glaucocyanea,* Melv. & Pons. Ann. & Mag. Nat. Hist. xviii. p. 317, pl. xvi. fig. 5.
1898. *Subulina acus* and *S. glaucocyanea,* M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Opeas acus* and *O. glaucocyaneum,* Stur. Südafr. Moll. p. 60.
1906. *Euonyma acus* and *glaucocyanea,* Pilsbry, Man. of Conch. xviii. pp. 40 & 48, pl. x. figs. 70, 76.

Hab. Port Elizabeth.

A stouter form than the type, often containing 13 whorls and measuring up to 28 mm. in length.

The type of *acus* in the British Museum and the only two cotypes that I have seen are dead and bleached; but good specimens, agreeing with them in other respects, vary in colour from bluish to yellowish olivaceous, and are somewhat dull, with often little striation on the upper whorls. Although apically of the same thickness, they increase into a stouter form than Krauss's figure, but in colour, sculpture, silky gloss, and other respects match the cotype in the Stockholm Museum. Allowing therefore for a degree of dimorphism and the fact that Krauss described his species from immature shells, it appears to me that *E. acus* and *E. turriformis* are identical.

In a large series of *E. glaucocyanea*, M. & P., it will be found that the colour varies very considerably from bluish to yellowish olivaceous, the shell remaining the same in texture and consistency and all other details. *E. acus* is not glaucocyaneous, but in size, sculpture, form of spire, and shape of whorls it agrees with *E. glaucocyanea*. The columella, too, in both shells is rather peculiarly concave and similar. As the colour, its chief characteristic, is a variable quantity, it seems inadvisable to regard *glaucocyanea* as distinct from *acus*, which comes from the same vicinity.

Var. *sarissa*, Pilsbry.

1906. *Euonyma turriformis sarissa*, Pilsb. Man. of Conch. xviii. p. 44, pl. x. figs. 84, 85.

Hab. NATAL (*Cassin*).

A yet stouter form, with apparently less sculpture. When more is known of the anatomy this may be found to constitute a different species. The largest specimen I have seen contains 10 whorls and measures 21 × 6 mm.

A shell of frequent occurrence in the neighbourhood of Grahamstown agrees very closely with the typical *turriformis* of Natal, except for a distinctly shorter aperture, specimens which I have measured being respectively:—

Shell. mm.	Aperture. mm.	Last whorl. mm.
16·0×4·5	4·0×2·1	6·4
11·7×3·5	3·4×1·5	5·2
12·5×3·5	3·8×1·7	5·6

5. *Euonyma læocochlis* (Melv. & Pons.).

1896. *Subulina læocochlis*, M. & P. Ann. & Mag. Nat. Hist. xviii. p. 316, pl. xvi. fig. 3.
1898. *Subulina læocochlis*, M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Euonyma læocochlis*, M. & P., Sturany, Südafr. Moll. p. 62.
1906. *Euonyma læocochlis*, M. & P., Pilsbry, Man. of Conch. xviii. p. 39, pl. x. fig. 68.

Hab. CAPE COLONY, Humansdorp, St. Francis Bay.

An easily recognizable sinistral species.

6. *Euonyma cacuminata* (Melv. & Pons.).

1892. *Stenogyra cacuminata*, M. & P. Ann. & Mag. Nat. Hist. ix. p. 85, pl. vi. fig. 2.
1898. *Subulina cacuminata*, M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Opeas cacuminatum*, M. & P., Stur. Südafr. Moll. p. 60.
1906. *Euonyma cacuminata*, M. & P., Pilsb. Man. of Conch. xviii. p. 42, pl. x. figs. 71, 73, 74.

Hab. Cape Colony, Bedford.

An imperforate highly polished shell, with very blunt apex and next to no sculpture; very easily distinguishable from any but the two succeeding species, both of which, however, are larger.

7. *Euonyma platyacme*, Melv. & Pons.

1907. *Euonyma platyacme*, M. & P. Ann. & Mag. Nat. Hist. xix. p. 101, pl. vi. fig. 15.
1907. *Stenogyra beckeri*, Fulton, Ann. & Mag. Nat. Hist. xix. p. 154.

Hab. Cape Colony, Kei Road Bush (*Miss Hickey*); Pondoland (*Becker*); Hog's Back Mountain, Queenstown (*Farquhar*).

A large, imperforate, smooth, and very glossy species, with a remarkably obtuse apex, resembling *cacuminata*, M. & P., but far exceeding it in all dimensions. It possibly attains greater size than that of any specimen yet known to collectors.

S. beckeri was described by Fulton from shells collected by Dr. Becker in Pondoland, but as the description was published some weeks after that of *E. platyacme*, it gives place to the latter, which is the same species.

8. *Euonyma purcelli* (Melv. & Pons.).

1901. *Subulina purcelli*, M. & P. Ann. & Mag. Nat. Hist. viii. p. 317, pl. ii. fig. 6.
1906. *Euonyma purcelli*, M. & P., Pilsb. Man. of Conch. xviii. p. 42, pl. x. fig. 75.

Hab. Cape Colony, Houw Hoek, Caledon Div. (*Purcell*).

Intermediate in size between *cacuminata* and *platyacme*, but distinguishable from either by its more convex whorls and the peculiar shape of its columella, which in most specimens is very noticeably obliquely truncate at the base, nearly approaching *Subulina*, though perhaps hardly sufficiently so to cause it to be placed in that genus. It was described from immature shells; the largest specimen that I have seen contains 9½ whorls, and measures 25×6·5 mm., aperture 6×3·2, last whorl 9·8 mm.

9. *Euonyma lymneæformis* (Melv. & Pons.).

1901. *Obeliscus lymneæformis*, M. & P. Ann. & Mag. Nat. Hist. viii. p. 317, pl. ii. fig. 5.
1906. *Euonyma lymneæformis*, M. & P., Pilsbry, Man. of Conch. xviii. p. 39, pl. x. fig. 69.

Hab. NATAL, Karkloof Bush (*McBean*).

A conspicuous shell, easily distinguishable by the author's illustration. Only two specimens, however, were originally discovered, and subsequent search in the same locality has failed to reveal more. It seems therefore just possible that it may eventually prove to be but an abnormal variety of *E. lanceolata*, Pfr., which abounds in the neighbourhood and with which it has several features in common.

10. *Euonyma lanceolata* (Pfeiffer).

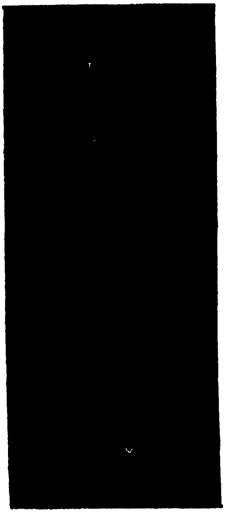
1854. *Bulimus lanceolatus*, Pfr. Proc. Zool. Soc. p. 292.
1855. *Bulimus lanceolatus*, Pfr. (*Obeliscus*) Mal. Blätt. ii. p. 156.
1857. *Bulimus micans*, Pfr. Mal. Blätt. iv. p. 156.
1859. *Bulimus micans*, Pfr. Mon. Hel. Viv. iv. p. 452.
1859. *Bulimus lanceolatus*, Pfr. Mon. Hel. Viv. iv. p. 455.
1881. *Stenogyra lanceolata*, Pfr. (*Obeliscus*) Nomenclator, p. 319.
1898. *Obeliscus lanceolatus*, Pfr., M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Stenogyra* (*Obeliscus*) *lanceolata*, Pfr., Stur. Südafr. Moll. p. 59.
1906. *Euonyma lanceolata*, Pfr., Pilsb. Man. of Conch. xviii. p. 40.

Widely distributed over Natal and Zululand. Specimens in the British Museum from Delagoa Bay.

A large species, with a shiny straw-coloured shell and comparatively faint striation, sometimes attaining such measurements as 59 mm. in length and 15 in breadth.

E. micans was described by Pfeiffer from shells collected in Natal by Plant, in the Cuming collection. It seems conceivable from the description that the species intended by Pfeiffer was that since described by Burnup as *natalensis*. But, whether owing to substitution or erroneous classification, all Cuming's specimens, including the so-called type, referred by him to *micans* in the British Museum are identical with *lanceolata*. The other more highly sculptured species was therefore left without a name, an omission very properly rectified when it was brought to notice under its present name of *natalensis*.

E. lanceolata never having been figured, an illustration of the type in the British Museum is here appended. Length 52 mm.



Euonyma lanceolata (Pfeiffer).

11. *Euonyma natalensis* (Burnup).

1905. *Obeliscus natalensis*, Burnup, Proc. Mal. Soc. vi. p. 304, pl. xvi. fig. 9.

1906. *Euonyma natalensis*, Burnup, Pilsbry, Man. of Conch. xviii. pp. 41, 339, pl. x. fig. 72, pl. xxxi. figs. 12, 13.

Hab. NATAL, Umbogintwini; Table Mountain; Equeefa; Pietermaritzburg (*Burnup*).

Another large species, distinguishable from *E. lanceolata*, Pfr., by its clearly marked close liration, which imparts a silky lustre to the shell. The largest specimen in coll. Burnup is 57·5 mm. in length.

12. *Euonyma pruizenensis* *, sp. n. (Pl. VI. fig. 11.)

Shell elongate, turriform, very narrowly rimate, olivaceous, rather thin, hardly glossy, semitransparent. Spire produced, moderately acute, apex bluntly rounded. Whorls (spec. max.) 8½, the apical small, smooth, mamillate; the

* Pronounced *prayzenensis*.

second and third about equal in size and more convex than the rest, which become less ventricose as they increase in distance between sutures, the last one or two being unusually flattened. The second whorl microscopically, remainder clearly covered with rather coarse curved striæ. Suture impressed. Aperture ovate, slightly rounded at base. Peristome thin, simple. Outer lip a little outcurved, arched forward in profile. Columella erect, margin narrowly reflexed. Callus none.

Dimensions (spec. max. in Brit. Mus.): shell 20·2 × 5·1, aperture 5·3 × 2·5, last whorl 8·7 mm.

Hab. NORTHERN TRANSVAAL, Pruizen; Bushveldt near Pietpotgietersrust (*Connolly*).

Although the species is very easily distinguishable, it varies greatly at different stages of growth, and the largest specimens that I have been able to procure are unfortunately dead and calcined. The contour of the spire is variable, sometimes evenly tapering, sometimes rather crooked and slightly attenuate towards the apex. The columella, too, in immature specimens is straight, while the slightly reflexed margin leaves a clearly visible rima; in mature shells it becomes twisted and the margin practically adnate, so that the shell is almost imperforate. *E. pruizenensis* differs from *E. cacuminata*, M. & P., whose form it somewhat resembles, in its longer aperture, dullish epidermis, and minute rima, *E. cacuminata* being highly glossy and imperforate.

The presence of sculpture on all but the mamillate apex of the new species is a noteworthy feature, the marking on the second whorl being almost visible without a lens.

13. *Euonyma siliqua*, sp. n. (Pl. VI. fig. 10.)

Shell elongate, rather subulate, imperforate, pale olivaceous, usually tinged with yellow, thin, normally glossy and nearly transparent. Spire produced, very slightly gradate, evenly but rather slowly tapering to the very bluntly rounded apex, which is nearly 1 mm. across. Whorls 8, pretty regularly and rather rapidly increasing in distance between sutures, but varying noticeably in circumference in different shells; convex, rather deeply impressed at the suture; the first two smooth, remainder rather irregularly sculptured with very fine curved striæ, plainly visible at intervals to the naked eye, but otherwise hardly discernible without a lens. Aperture ovate, rounded at the base; peristome thin, simple; outer lip curved outward and slightly bowed forward; columella erect, thickened and twisted upward, with no trace of reflection.

Shell 13·8 × 4·3, aperture 3·5 × 1·7, last whorl 6·5 mm.

Hab. NATAL, O.R.C., Junction Station (*Connolly*, six specimens).

The species is peculiarly subject to dimorphism, other specimens measuring:—

Shell. mm.	Aperture. mm.	Last whorl. mm.
13·8×4·0	3·6×1·8	6·5
12·4×4·2	3·7×1·5	6·4
10·3×3·5	3·2×1·7	5·7

A rather short thick species, with a very blunt apex, differing from all others of its size in the entire lack of any attempt at perforation. The fact that the smallest specimen measured above contains eggs supports the idea that the larger ones are at least almost mature.

14. *Euonyma varia*, sp. n. (Pl. VI. figs. 5, 6, 7.)

Shell elongate, narrow, turriform, rimate, pale yellowish olivaceous, thin, moderately glossy and transparent. Spire produced, acute, apex narrowly rounded. Whorls 10½, slightly convex, more so just below the suture; gradually and regularly increasing; the first two smooth, remainder covered with numberless very fine, faint, regular, curved, close-set striæ, imparting a slight silky gloss to the shell. Suture somewhat impressed. Aperture ovate, bluntly rounded at base. Peristome thin, simple. Outer lip a little swollen and then incurved, rather sharply arched forward to about 1½ mm. below the suture, and then noticeably receding in an almost straight line to the base. Columella nearly straight, margin narrowly triangularly reflexed. Callus none.

Shell 17·0 × 4·1, aperture 4·2 × 1·8, last whorl 6·6 mm.

Hab. TRANSVAAL, Pienaars Poort; Pretoria District (*Connolly*); Potchefstroom (*Miss Cachet*); Zoutpansberg (*Oregoe*).

A widely distributed species, to be found in many museum and private collections. Extreme forms differ very considerably in contour. The type, from Pienaars Poort, is about intermediate, with an evenly tapering spire and moderate apex. In a more slender form from Zwart Kop the apical whorls are finer and narrower, giving a more tapering and often slightly crooked appearance to the spire; in a coarser form the apex is blunter and the spire approaches *E. turriformis* in contour. The gloss and transparency is soon lost, even in live shells, which, if much exposed, become dull and opaque. The striation on the upper whorls is in most examples almost microscopic, and is throughout far more difficult to distinguish on fresh specimens than on weather-beaten ones. The largest shell I have yet seen of this species, from Zwart Kop, measures 19·5 × 4·5 mm., aperture 4·2 × 2·1, last whorl 7·2 mm.

In a genus like *Euonyma*, whose members exhibit so great a diversity of form, it is only after considerable hesitation that I have ventured to differentiate between the present most variable species and the equally variable *E. turriformis*, Krs., as, although the types look at first sight quite different, extremes of form may be found to run uncommonly near to one another. In *E. varia*, however, the whorls increase less rapidly and the last whorl and aperture are consequently slightly shorter than in *turriformis*. The epidermis, too, is of a less silky sheen and more stramineous colour. Mr. Cregoe's specimens from Zoutpansberg present one or two minor points of difference from the type, but, allowing a little for local variation and without further knowledge of the anatomy of the animal, it appears inadvisable to separate them.

15. *Euonyma standeri*, sp. n. (Pl. VI. fig. 9.)

Shell elongate, turriform, rimate, pale yellowish olivaceous, rather dull, with a silky sheen, thin, semitransparent; spire produced, gradually and evenly tapering, apex rounded, particularly blunt for the size of the shell, being 1 mm. in diameter. Whorls 7½, regularly increasing, moderately convex, the first two smooth, remainder thickly covered with close slightly curved striæ of rather irregular depth. Suture clearly defined. Aperture ovate, rounded at base, rather large in proportion. Peristome simple, acute; outer lip slightly outcurved; hardly bowed forward, but a little retracted toward the base; columella straight, margin triangularly reflexed.

Shell 14·0 × 4·5, aperture 4·5 × 1·9, last whorl 6·7 mm.

Hab. TRANSVAAL, Stander's Kop (*Connolly*, a large series).

Adult shells sometimes show traces of a slight callus. I have seen eggs in an example only 9·0 mm. long.

Possibly only a local form of *turriformis*, but distinguishable by its dull silky epidermis, longer apical whorls, and peculiarly blunt apex. In contour it closely resembles *E. siliqua*, a more shining imperforate shell.

16. *Euonyma unicornis*, sp. n. (Pl. VI. fig. 3.)

Shell elongate, narrow-turriform, rimate, olivaceous, very thin, rather glossy and transparent. Spire much produced, acute, very slowly evenly tapering; apex narrowly rounded. Whorls 11½, very gradually increasing, convex, the first two smooth, remainder sculptured with innumerable close, curved, regular striæ, which are not apparent to the naked eye until the fifth whorl. Suture rather deep. Aperture short, nearly elliptical, base rounded. Peristome simple, acute. Outer lip very slightly curved outward, rather sharply arched forward about 1·3 mm. below the suture, and then receding rather rapidly to the base. Columella slightly concave, margin narrowly triangularly reflexed. Callus none.

Shell 21 × 4·4, aperture 4·2 × 2·5, last whorl 7 mm. Type in my collection.

Hab. TRANSVAAL, Schanz Kop, Pretoria (*Connolly*); Potchefstroom (*Miss Livingston*). CAPE COLONY, Cradock (*Farquhar*).

Although very nearly approaching *E. varia*, the present species differs constantly in having one more whorl and slightly shorter aperture in comparison to its size, and in its rather more convex whorls.

The Cradock form has a rather blunter apex and very slightly coarser striation than the type; but without further knowledge of the anatomy it is inadvisable to regard it as different.

Genus OPEAS, Albers, 1850.

(Die Heliceen, p. 175.)

Small shells, rarely exceeding 13 mm. in length, with a large, smooth, obtuse apex; generally separable from *Euonyma* by their smaller size and from *Curvella* by their more slender form.

1. *Opeas crawfordi* (Melv. & Pons.).

1893. *Stenogyra crawfordi*, M. & P. Ann. & Mag. Nat. Hist. xii. p. 105, pl. iii. fig. 4.
1898. *Subulina crawfordi*, M. & P. Proc. Mal. Soc. iii. p. 179.
1898. *Opeas crawfordi*, M. & P., Stur. Südafr. Moll. p. 61.
1906. *Opeas crawfordi*, M. & P., Pilsb. Man. of Conch. xviii. p. 149, pl. xv. fig. 74.

Hab. CAPE COLONY, Van Staaden's River (*Crawford*).

A very small species, resembling in shape many others distributed over the southern portion of the peninsula, but not approaching them in size. The figure accompanying the original description is very misleading, as it appears to portray a far coarser form than the type.

2. *Opeas durbanense*, Sturany.

1898. ***Opeas durbanense***, Stur. Südafr. Moll. p. 61, pl. ii. figs. 42-44 (reprint).
1899. ***Opeas durbanense***, Stur. Denkschr. k. Akad. Wiss. Wien, lxvii. p. 597, pl. ii. figs. 42-44.
1906. *Opeas durbanense*, Stur., Pilsbry, Man. of Conch. xviii. p. 149, pl. xv. figs. 75, 76.

Hab. NATAL, Durban (*Dr. Penther*).

Described from a single specimen; I have not heard of any more having been discovered.

3. *Opeas mcbeani*, Melv. & Pons.

1903. ***Opeas mcbeani***, M. & P. Ann. & Mag. Nat. Hist. xii. p. 604, pl. xxxi. fig. 8.
1906. *Opeas mcbeani*, M. & P., Pilsbry, Man. of Conch. xviii. p. 150, pl. xv. fig. 77.

Hab. TRANSVAAL, Boksberg (*Burnup*, fid. *M. & P.*); Hennop's River, near Pretoria (*Connolly*); Middelburg (in Coll. Ponsonby).

A very slender shell, smaller than *Euonyma crystallina*, M. & P., and less highly sculptured than *O. strigile*, M. & P., from which it also differs in its less fusiform contour.

4. *Opeas strigile* (Melv. & Pons.).

1901. ***Subulina strigilis***, M. & P. Ann. & Mag. Nat. Hist. viii. p. 318, pl. ii. fig. 7.
1906. ***Opeas strigilis***, M. & P., Pilsbry, Man. of Conch. xviii. p. 150, pl. xv. fig. 57.

Hab. NATAL, Karkloof (*McBean*); Dargle, Edendale, Pietermaritzburg, Enon Bush, Richmond, Hilton Road (*Burnup*).

A beautifully striate little species with rather fusiform contour.

5. *Opeas tugelense* (Melv. & Pons.).

1897. ***Subulina tugelensis***, M. & P. Ann. & Mag. Nat. Hist. xix. p. 637, pl. xvii. fig. 9.
1898. ***Subulina tugelensis***, M. & P. Proc. Mal. Soc. iii. p. 179.
1898. ***Opeas tugelense***, M. & P., Sturany, Südafr. Moll. p. 61.
1906. ***Opeas tugelense***, M. & P., Pilsbry, Man. of Conch. xviii. p. 150, pl. xv. fig. 78.

Hab. NATAL, Lower Tugela River, Pinetown, Tongaat (*Burnup*); Pietermaritzburg (*Connolly*). Young shells, apparently inseparable from this species, from DELAGOA BAY (*Connolly*).

A stouter form than *Euonyma crystallina*, and easily distinguished from *E. turriformis* by its almost colourless sculptureless whorls and highly polished transparent shell. Even more variable in breadth than most members of the subfamily.

The type was described as being 14 mm. in length and 4 in breadth, but I have seen specimens measuring 12·0 × 3·5 and 13·5 × 5·5 respectively.

6. *Opeas eulimoide* (Preston).

1900. *Subulina eulimoides*, Prest. Ann. & Mag. Nat. Hist. iv. p. 499 (fig.).

Hab. NATAL, Howick.

Evidently not a *Subulina*, as the columella is straight, and apparently best placed in *Opeas* on account of its small size. I have not seen this species; Mr. Preston informs me that the whorls are much less convex than in *E. crystallina*, M. & P., to which it appears rather nearly allied.

7. *Opeas lepidum*, sp. n. (Pl. VI. fig. 12.)

Shell small, elongate, turriform, subrimate, pale olivaceous, thin, glossy, semitransparent. Spire produced, acute, evenly tapering, apex rounded. Whorls 6, rather convex, regularly increasing; the first smooth, the second nearly so, remainder extremely faintly sculptured with regular curved striæ, which are only just visible to the naked eye. Suture clearly defined. Aperture short, oblong-oval, base rounded. Peristome thin, simple. Outer lip strongly curved outward and gently arched forward. Columella very slightly concave, margin narrowly reflexed, almost concealing the minute rima. Callus none.

Shell 7·0 × 2·5, aperture 2·3 × 1·2, last whorl 3·7 mm.

Hab. CAPE COLONY, Fern Kloof, Grahamstown (*Farquhar*); Port Elizabeth (*Crawford*).

Mr. Farquhar observes that this pretty little species regularly occurs, seldom exceeding the above-quoted dimensions, in a locality very favourable for producing the full growth of the shell. It compares closely with the figure and description, but not with actual specimens in the British Museum, of *Curvella delicata*, "Gibbons" Taylor, while it cannot be associated with such as *O. clavulinum*, Potiez and Michaud, or *O. spinula*, Morelot, which nearly approaches it in form. While very near the border-line between *Opeas* and *Curvella*, I consider the comparative slenderness of its contour sufficient reason for placing the present species in *Opeas*.

Genus CURVELLA, Chaper, 1885.

(Bull. Soc. Zool. de France, x. pp. 48, 49.)
(= *Hapalus*, Albers, 1850, non *Hapalus*, Billberg, 1820.)

Small shells, so named because of the forward curve of the outer lip. Very near *Opeas*, from which they are generally chiefly separable by their shorter wider contour and smaller number of whorls.

1. *Curvella catarractæ* (Melv. & Pons.).

1897. *Hapalus catarractæ*, M. & P. Ann. & Mag. Nat. Hist. xix. p. 635, pl. xvii. fig. 4.
1898. *Curvella catarractæ*, M. &. P. Proc. Mal. Soc. iii. p. 179.
1898. *Hapalus catarractæ*, M. & P., Stur. Südafr. Moll. p. 62.
1906. *Curvella catarractæ*, M. & P., Pilsb. Man. of Conch. xviii. p. 59, pl. viii. fig. 23.

Hab. NATAL, Howick, Pietermaritzburg, Stella Bush (*Burnup*); Durban (*Penther*, fid. *Sturany*).

A rather characterless little shell with obtuse apex and rather ventricose body-whorl. The largest specimen in Coll. Burnup measures 6·5 × 3·5 mm. Like others of the genus, this species has a partiality for living in ants' nests, where Mr. Burnup informs me he has more than once found them.

2. *Curvella globosa* (Melv. & Pons.).

1898. *Hapalus globosus*, M. & P. Ann. & Mag. Nat. Hist. ii. p. 128, pl. vii. fig. 6.
1898. *Curvella globosa*, M. & P. Proc. Mal. Soc. iii. p. 179.
1906. *Curvella globosa*, M. & P., Pilsb. Man. of Conch. xviii. p. 61, pl. viii. fig. 31.

Hab. NATAL, Stella Bush (*Burnup*). CAPE COLONY, York, Drakensberg, Griqualand East (*Farquhar*).

A small shell, whose whorls, especially the last, are more swollen in comparison than those of any of its allies. With this exception, however, it bears a marked resemblance to the preceding species.

3. *Curvella sinuosa*, Melv. & Pons.

1899. *Curvella sinuosa*, M. & P Ann. & Mag. Nat. Hist. iv. p. 198, pl. iii. fig. 12.

1906. *Curvella sinuosa*, M. & P., Pilsb. Man. of Conch. xviii. p. 61, pl. viii. fig. 32.

Hab. NATAL, Umkomaas (*Burnup*).

"An elegant, fusiform *Curvella* . . . whose chief peculiarity is its sinuous lip" (*M. & P.*).

4. *Curvella caloglypta*, Melv. & Pons.

1901. *Curvella caloglypta*, M. & P. Ann. & Mag. Nat. Hist. viii. p. 320, pl. ii. fig. 12.

1906. *Curvella caloglypta*, M. & P., Pilsb. Man. of Conch. xviii. p. 59, pl. viii. fig. 22.

Hab. NATAL, Pietermaritzburg (*Burnup*).

A beautifully sculptured little shell, at once distinguishable from its South-African confrères.

5. *Curvella croslyi*, Burnup.

1905. *Curvella croslyi*, Bp. Proc. Mal. Soc. vi. p. 302, pl. xvi. figs. 3, 4.

1906. *Curvella croslyi*, Bp., Pilsb. Man. of Conch. xviii. p. 59, pl. viii. figs. 27, 28.

Hab. ZULULAND, Makowe (*Crosly*).

Much the largest of yet known South-African *Curvellæ*.

6. *Curvella straminea*, Burnup.

1905. *Curvella straminea*, Bp. Proc. Mal. Soc. vi. p. 303, pl. xvi. figs. 5, 6.

1906. *Curvella straminea*, Bp., Pilsb. Man. of Conch. xviii. p. 62, pl. viii. figs. 36, 37.

Hab. CAPE COLONY, Walmer (*Miss Hickey*).

"More elongate and slender" (than the preceding forms), "and conspicuous by its straw-colour and distinct sculpture" (*Burnup*).

7. *Curvella succinea*, Burnup.

1905. *Curvella succinea*, Bp. Proc. Mal. Soc. vi. p. 303, pl. xvi. figs. 7, 8.

1906. *Curvella succinea*, Bp., Pilsb. Man. of Conch. xviii. p. 62, pl. viii. figs. 38, 39.

Hab. CAPE COLONY, Maeström Forest, Bedford (*Farquhar*).

"Distinct from *C. straminea* by its smaller size, richer" (pale horn) "colour, less ventricose whorls, and shallower suture" (*Burnup*).

8. *Curvella elevata*, Burnup.

1905. *Curvella elevata*, Bp. Proc. Mal. Soc. vi. p. 304, pl. xvi. figs. 10, 11.

1906. *Curvella elevata*, Bp., Pilsb. Man. of Conch. xviii. p. 60, pl. viii. figs. 29, 30.

Hab. CAPE COLONY, Mountain Drive, Grahamstown (*Farquhar*).

A comparatively slender form, the spire being more produced, with straighter sides, than in most of the foregoing.

9. *Curvella majubana*, sp. n. (Pl. VI. fig. 13.)

Shell conic-ovate, narrowly umbilicate, thin, glossy, transparent, pale olivaceous. Spire produced, evenly tapering, apex rather acute. Whorls 6, regularly and somewhat rapidly increasing, slightly convex, the first two smooth, remainder beautifully sculptured with very fine, clear, close striæ, following the curve of the outer lip. Suture simple, of moderate depth. Aperture ovate, rounded at the base. Peristome simple, acute. Outer lip slightly curved outward and about equally arcuate forward. Columella straight, margin narrowly triangularly reflexed over (nearly concealing) the umbilicus.

Shell 9·6 × 3·4, aperture 3·5 × 1·6, last whorl 5·3 mm.

Hab. NATAL, Amajuba, in an ants' nest (*Connolly*).

A pretty shell, the most graceful of yet known South-African *Curvellæ*, and easily distinguished by the symmetry of its form and acuteness of its apex. Its nearest ally is the East-African *C. associata*, E. A. Smith, from which it differs chiefly in its finer apex and fainter sculpture. In dead specimens the shell is often clouded with yellowish white. Adult shells usually show trace of a white callus.

10. *Curvella saundersæ*, sp. n. (Pl. VI. fig. 14.)

Shell conic-ovate, rimate, olivaceous, thin, glossy, transparent. Spire produced, evenly tapering; apex rounded. Whorls 5½, rather rapidly increasing, slightly convex, the first two smooth, remainder extremely faintly marked with close curved striæ, barely visible to the naked eye. Suture rather shallow. Aperture ovate, bluntly rounded at base. Peristome simple, acute. Outer lip slightly curved outward and arcuate forward. Columella straight, margin narrowly triangularly reflexed. Callus none. Shell 7·6 × 3·4, aperture 3·2 × 1·5, last whorl 4·9 mm.

Hab. ZULULAND, Eshowe (*Lady Saunders*).

A nearly smooth graceful species, whose nearest alliance is with *C. majubana*, from which it is separated by its blunter apex and fainter striation.

11. *Curvella modesta*, sp. n. (Pl. VI. fig. 15.)

Shell small, conic-ovate, rather subulate, rimate, pale olivaceous, thin, glossy, almost transparent. Spire produced, acute, evenly tapering, apex rounded. Whorls 5½, regularly and rather rapidly increasing in distance between sutures, rather convex, covered, after the first 1½, with fine, regular, curved striæ, which are almost invisible without a strong lens. Suture well defined, of moderate depth. Aperture ovate, rounded at base. Peristome simple, acute. Outer lip somewhat curved outwards and slightly arched forward. Columella very slightly concave, margin narrowly reflexed.

Shell 6·8 × 2·8, aperture 2·5 × 1·2, last whorl 4 mm.

Hab. CAPE COLONY, Dassie Crantz, Grahamstown; Cradock Commonage (*Farquhar*).

A difficult little species, recalling both *C. elevata* and *C. straminea*, Burnup. From the latter it differs chiefly in colour, being pale olivaceous instead of stramineous, while it is a rather more slender form than *C. elevata*.

Genus HYPOLYSIA, Melv. & Pons., 1901.

(Ann. & Mag. Nat. Hist. viii. 1901, p. 318.)

A slender form, distinct from *Opeas* through its projecting evolute outer lip.

1. *Hypolysia florentiæ*, Melv. & Pons.

1901. *Hypolysia florentiæ*, M. & P. Ann. & Mag. Nat. Hist. viii. p. 318, pl. ii. fig. 8.
1903. *Hypolysia florentiæ*, M. & P. Ann. & Mag. Nat. Hist. xii. p. 596, pl. xxxii. fig. 13.
1906. *Hypolysia florentiæ*, M. & P., Pilsb. Man. of Conch. xviii. p. 37, pl. x. figs. 66, 67.

Hab. Widely distributed through Natal, Zululand, and the Eastern Province of Cape Colony.

A very finely striate, transparent, narrowly rimate shell, generally somewhat fusiform in contour, with distinctly filiform suture.

This species is unusually subject to dimorphism, some specimens from Eshowe being nearly double the width of the type, though otherwise agreeing with it in all respects.

Owing to the sculpture following the peculiar curve of the outer lip, it is not difficult to distinguish *Hypolysia* even if the evolute lip itself is broken.

EXPLANATION OF PLATE VI.

Fig. 1. *Euonyma turriformis*, Krs. (Stockholm Museum).
Fig. 2. *Euonyma turriformis*, Krs., var. *acus*, Morelet (type, in British Museum).
Fig. 3. *Euonyma unicornis*, sp. n.
Fig. 4. *Euonyma linearis*, Krs. (Stockholm Museum).
Fig. 5. *Euonyma varia*, sp. n. (type).
Figs. 6, 7. *Euonyma varia*, sp. n.
Fig. 8. *Euonyma pietersburgensis*, Preston, var. *levis*, nov.
Fig. 9. *Euonyma standeri*, sp. n.
Fig. 10. *Euonyma siliqua*, sp. n.
Fig. 11. *Euonyma mruzenensis*, sp. n.
Fig. 12. *Opeas lepidum*, sp. n.
Fig. 13. *Curvella majubana*, sp. n.
Fig. 14. *Curvella saundersæ*, sp. n.
Fig. 15. *Curvella modesta*, sp. n.

XXIX.—*Descriptions and Records of Bees.*—XXXII.

By T. D. A. Cockerell, University of Colorado.

Pseudopanurgus æthiops (Cresson).

Berkeley (near Denver), Colorado (*Oslar*). In Coll. Baker.

Halictus clelandi, sp. n.

♂.—Length about 6 mm.

Head and thorax black, abdomen and legs dark reddish brown; pubescence greyish white, rather abundant; lower part of clypeus cream-colour, the actual margin ferruginous; mandibles ferruginous, dark at base; flagellum long, crenulate, dark coffee-brown beneath.

This cannot be the male of *H. globosus*, as the thorax has no æneous tinge, and the second r. n. and third t.-c. are very distinct (*H. cognatus*, Sm., is probably the male of *globosus*). The much darker flagellum easily distinguishes it from *H. oxleyi*. Head broad, eyes converging below, face with much light hair; front minutely, very densely punctured, a very small space in front of ocellus smooth and shining; mesothorax hairy, finely and densely punctured, but shining; area of metathorax semilunar, with fine irregular rugæ extending over the whole surface; pleura shining; tegulæ rather large, smooth, pale reddish testaceous. Wings ample, hyaline, nervures and stigma pale testaceous; second s.m. receiving first r. n. before the end; third s.m. very much larger than second. Small joints of tarsi becoming ferruginous; spurs yellowish white. Abdomen broad for a male, quite hairy, the lateral bases of second and third segments with denser hair, making rather inconspicuous patches; surface shining, with very fine close punctures, about the same on first two segments, but becoming weaker beyond; hind margins of segments slightly reddish pallescent.

Hab. Adelaide, Australia (*Schomburgk*). Berlin Museum.

Halictus chapmani, sp. n.

♀.—Length about 7 mm.

Very close to *H. repræsentans*, Sm., but smaller. Smith compares *repræsentans* with the European *leucozonius*; the present species, compared with *leucozonius*, is much smaller, with narrower (instead of broader) second s.m., third t.-c. and second r. n. much weakened, clypeus less produced, mesothorax more finely punctured, hind spur with a big truncate subbasal tooth, and a long low lamina beyond (with a series of nodules in *leucozonius*), &c. In size and general appearance *H. chapmani* resembles not *leucozonius*, but *lineolatus*, Lep. The sculpture is essentially as in *repræsentans*. Black, the abdomen shining, the hind margins of the segments broadly very dark reddish; hair of head and thorax rather dull white, not at all fulvous or ochraceous; mandibles chestnut-red, black at base; clypeus broad, very shiny, with large well-separated punctures; front dull and granular, but under the microscope more shining, with minute punctures between longitudinal ridges; flagellum dark brown beneath, redder apically; mesothorax and scutellum shining, but quite closely punctured, anteriorly on mesothorax ridges are developed like those on front, only transverse; area of metathorax semilunar, with fine longitudinal ridges, more or less irregular and connected by cross-ridges; posterior truncation sharply defined at sides; pleura with much white hair; tegulæ shining rufo-piceous. Wings very faintly dusky, nervures and stigma reddish sepia; b. n. very nearly reaching t.-m.; second s.m. receiving first r. n. before end; third s.m. considerably larger than second, third t.-c. with only a single curve. Legs very dark reddish brown, with white hair; abdomen broad, rather hairy, except middle of first three segments, the first two segments finely punctured, shining; base of second segment with a white hair-patch on each side, third and fourth with thin indistinct basal hair-bands; second ventral segment pollen-collecting.

Hab. Western Australia (*Preiss*). Berlin Museum, 2564.

Halictus asperithorax, sp. n.

♀.—Length about 8 mm.

Black, hair of head and thorax white below, dull pale ochraceous above. A species related to *H. chapmani*, but easily separated by the dull coarsely rugoso-punctate mesothorax. Mandibles dark, reddish subapically, and with shining golden hairs; clypeus broad, not produced, shining, with grooves and a few scattered punctures; front broad, appearing minutely granular, but microscopically longitudinally striate, with rows of punctures separated by raised lines; flagellum dull brown beneath; mesothorax coarsely granular, with very dense punctures; scutellum more shining and much more finely punctured; area of metathorax broad, very finely lineolate all over; posterior truncation large and very well defined; the scutellum has a few very large punctures scattered among the small ones; tegulæ shining rufous, not punctured. Wings faintly dusky, stigma and nervures dilute sepia; third t.-c. and second r. n. greatly weakened; second s.m. very large and broad, receiving first r. n. nearly at its end. Legs very dark reddish, with pale hair, yellowish on inner side of tarsi; hind spur with a broad but not long subbasal truncate tooth, and obscure crenulatiform teeth beyond (*H. lanarius* type of spur); abdomen broad, with an evident dark reddish tint, granular from minute punctures, with broad dull white basal hair-bands, that on second segment failing in middle. In my table in 'Entomologist,' Nov. 1905, this runs straight to *H. gilesi*, which it much resembles, differing in the microscopic characters. The second abdominal segment is minutely and nearly uniformly punctured all over, the punctures running more or less into grooves near the posterior margin; in *gilesi* the puncturation is more diversified, but in both the transverse lineolation can be seen. The front is also different.

Hab. Melbourne, Victoria, Aug. 1900 (*C. F.*, Turner Collection). British Museum.

Parasphecodes plorator, sp. n.

♀.—Length about 10 mm.

Easily known from all the other species by the entirely black head, thorax, and abdomen, with scanty pale pubescence, the dark reddish legs, and the very dark smoky wings. Mandibles dark; lower edge of clypeus with long golden hairs; clypeus shining, with irregular punctures; front appearing granular, microscopically lineolate and pleated, producing a curious wave-like effect; flagellum (except at base) obscure coffee-brown beneath; mesothorax dull, with scattered very minute punctures, the median groove strong; under the microscope the mesothoracic surface is seen to be minutely tessellate; tubercles densely fringed with pale hair; area of metathorax large, minutely granular, not at all plicate; posterior truncation heart-shaped, shining, well-defined; tegulæ dark reddish. Wings very dark, with a violaceous lustre; stigma and nervures dark reddish; first r. n. meeting second t.-c.; third t.-c. with a simple curve; b. n. rather less bent than is usual in *Halictus*; wings large, as in *Parasphecodes*. Hind spur simple. Abdomen shining, narrowed basally, widest at the third segment; apical segments with dark fuscous hair; no hair-bands or patches; hind margin of second segment reddish; apex of fifth segment obtusely pointed, covering sixth; venter with white hair, more or less curled, and doubtless pollen-collecting; apex of venter with fuscous hair.

Hab. Melbourne, Victoria, Aug. 1900 (*C. F.*, Turner Collection). British Museum.

Protoxæa texana (Friese).

Lee County, Texas, Aug. 10, ♀, Aug. 26, ♂, 1907 (*Birkmann*).

These splendid bees, which occurred on flowers of *Polygonum*, evidently belong to the species from Texas which Friese named in manuscript *Oxæa texana*, but published under *O. vagans*, Fox. True *O. vagans* comes from Lower California, and has the ventral hair of the thorax pallid, not dark brown or almost black as in *texana*. The eyes also of the male more nearly touch above in *vagans* than in *texana*. I suppose that the Cypress Mills, Texas, example cited by Fox was really *texana*. The male agrees with Friese's description, except that at certain angles slight green and purple tints can be seen on the abdomen, a character more pronounced in the female. The female, not before described, is very large (length about 24 mm.), with the usual sexual differences. The clypeus has coarse, large, partly confluent punctures; the front on each side of the antennæ is dull and granular, not punctured for some distance; the basal half of the second abdominal segment is rather closely punctured. The insect must go in *Protoxæa*, as it has six-jointed maxillary palpi. The tongue is linear, though broader than in *Oxæa flavescens*; the apical plate of the abdomen is bidentate.

The wings are much darker than in *O. tristis*, and there are other differences.

Nomia pattoni, Ckll.

Fedor, Texas, Oct. 18, 1897 (*Birkmann*).
New to Texas.

Nomia nortoni, Cresson, var. *plebeia*, n. var.

♀.—The three abdominal bands clear ferruginous instead of green. This looks like a new species, but has the structure of *nortoni*, and is surely only a variety. The type specimen bears many mites, especially on the prothorax *.

Hab. Fedor, Texas, June 18, 1905 (*Birkmann*).

Typical *N. nortoni* occurs at Fedor, visiting flowers of mesquite, horse-mint, *Polygonum*, &c., as Mr. Birkmann informs me.

Nomia maneei, sp. n.

♀.—Length about 9 mm.

Black, with green apical tegumentary bands on abdominal segments 2 to 4; no trace of a green band on first segment, but a patch of white hair on each side, the rudiment of an apical hair-band. This beautiful species has been confused with *N. foxii*, from which it is readily separated thus: labial palpi with joints 2 to 4 much longer; punctures of mesothorax well formed anteriorly; middle of scutellum with sparse punctures on a shining ground, and no little punctures between; wings a little darker, b. n. meeting t.-m.; second abdominal segment with smaller punctures; third appearing

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* *Disparipes texanus*, sp. n.—Length 167, breadth 147 μ. Pale red, shiny, anterior border of body broadly hyaline; shape as in *D. americanus*, Banks, to which it is closely allied, but the following characters are distinctive: large humeral bristles not so near the margin; three pairs of bristles on the posterior margin, the intermediate pair slender, the inner longer than the intermediate (these bristles rather variable); two pairs of very large ventral abdominal bristles, the anterior pair more laterad than the posterior; hind foot with a very long bristle in addition to the shorter ones; long subapical bristle of hind foot accompanied by a shorter one; first three pairs of legs very much more bristly than in Banks's figure of *D. americanus*; sternal sclerites apparently longer in proportion to their breadth; claws much more robust, especially at base, and much more strongly hooked, bent to less than a right angle; clavate organs behind anterior legs large and well developed, but not setiferous as figured for *D. americanus*.

Hab. On *Nomia nortoni*, var. *plebia*, attached to the thoracic hairs; Fedor, Texas, June 18 (*Birkmann*).

granular from the excessively minute punctures, and fourth the same; abdominal bands very beautiful, emerald-green shot with lilac, the third more lilac than green. Known from *N. mesillensis* by the more closely punctured first abdominal segment, the much narrower and differently coloured bands, &c. The tongue is linear.

Hab. Southern Pines, North Carolina, June 19, 1909 (*A. H. Manee*). In coll. Birkmann.

Nomia fedorensis, sp. n.

♀.—Like *N. maneei*, but a little larger, with the following distinctive characters: flagellum bright ferruginous beneath (duller and browner than in *maneei*); disc of scutellum much more closely punctured; first abdominal segment with very strong, regular punctures; second also much more strongly punctured; abdominal bands broader, very brilliant, coloured as in *maneei*, except that the first is flushed with vermilion. Both species have a prominent ridge down the middle of the clypeus; this also occurs in *foxii*. *N. fedorensis* is easily known from *foxii* by the much more finely and closely punctured third abdominal segment, and the very strongly and regularly punctured first segment.

♂.—Similar to *N. foxii*, but very easily separated by the entirely black legs, the hind femora much thicker and more humped above. The second abdominal segment has a very deep constriction; the fourth segment is punctured in the manner of *foxii*, not at all as in *universitatis*.

Hab. Fedor, Lee County, Texas, June 7, 1909, June 1910 (*Birkmann*).

Lithurgus albofimbriatus, Sichel.

The *Lithurgus* from Tahiti, which I formerly recorded as *L. atratiformis*, Ckll., is in reality *L. albofimbriatus*. The two species are extremely closely allied, but *atratiformis* has the white bands on abdomen, above and below, about twice as broad as in *albofimbriatus*.

Megachile aurifrons, Smith.

Smith described this from "New Holland," but I have a specimen from his collection labelled Queensland. Mr. Turner also took it at Mackay (his number 288). The mandibles of this species are five-toothed in the female.

Megachile sequior, Ckll.

This species was described from a male labelled "Adelaide, *Schomburgk.*" I have reason for thinking that it was really a Schultzian specimen from Port Darwin, which passed through Schomburgk's hands. At any rate, four males were taken by Turner at Port Darwin, Dec. 1902. The female, not before described, is represented by a specimen from N.W. Australia (*C. F.*, Turner Collection), in the British Museum. It is about 11½ mm. long, the thorax six-spotted like the male, the pubescence also coloured as in the male; flagellum dull ferruginous beneath; eyes green; ventral scopa white, black on last segment. It is very close to *M. macularis*, D. T., and would at first sight be taken for it, but it may be separated by the black hairs which project at sides of abdomen being confined to the fifth and sixth segments, and also by the green eyes.

Megachila rhodura, Ckll.

The female, hitherto unknown, was taken by Mr. Turner at Mackay, Queensland, at flowers of *Eucalyptus*, Dec. 1899. It is about 12½ mm. long, in general similar to the male, the tegument of the last segment, and the penultimate except at base, red, covered with fine appressed fulvous hair, which also extends forward over the fourth segment. Head large, oblong, the eyes slightly *diverging* below; sides of face with pure white hair; middle of lower edge of clypeus with a small nodule, defined by a notch on each side; eyes light green; mandibles long, the cutting-edge thickly fringed with red hair, in the manner of *M. trichognatha*, Ckll., which is related; ventral scopa entirely white.

Megachile trichognatha, Ckll.

A new locality is Victoria (*C. F.*, Turner Collection). British Museum. *M. ferox*, Sm., bears the same data; it was described from Swan River. *M. tomentella*, Ckll., also occurs in Victoria (*C. F.*) and by Swan River.

Megachile pararhodura, sp. n.

♂.—Length 10 mm.

So close to *M. rhodura* that only careful comparison shows it to be different. Abdominal segments 3 to 6 have the tegument chestnut-red, a darker tint than the red of *rhodura*; the abdomen is broader, and the large apical lobes are wider apart; the tarsi have longer and more abundant hair, and the yellowish-white hind tibial spurs are very much larger; the middle tarsi are shorter, especially the last joint; the face (covered with white hair) is a little broader. Tarsi and coxæ of anterior legs simple.

Hab. Mackay, Queensland (*Turner*, 325). British Museum.

The hind spur is 595 μ long, minutely serrulate. That of *M. rhodura* measures about 425 μ.

Megachile mackayensis, sp. n.

♀.—Length about 12 mm.

Black, of the parallel-sided type, the hair of front, sides of face, and a large patch covering the fifth and sixth and more than apical half of fourth segments of abdomen, all very bright fox-red. Head round seen from in front; mandibles broad, deeply grooved; clypeus densely rugoso-punctate, short but arched and prominent, the lower margin crenulate; antennæ wholly dark; eyes dark reddish; vertex very finely and densely punctured, with fuscous hair (some fulvous posteriorly); cheeks with white hair; mesothorax and scutellum very closely punctured but shining, the hair of scutellum and front and sides of mesothorax fuscous, but on disc of latter mainly yellowish, though very thin and inconspicuous; a tuft of creamy-white hair is at each posterior corner of mesothorax, and a larger one just behind tubercles, though the hair on the latter is black; hair of uppermost part of pleura black or fuscous, otherwise dull white; sides of metathorax with much creamy-white hair; tegulæ piceous. Wings moderately dusky; second s.m. very long. Legs black, with white hair, that on the inner side of the moderately broad hind basitarsus fulvous; spurs brown, hind spur bent at apex. Abdomen above, except for the large red patch, black without bands or spots; ventral scopa creamy white, dark fuscous on last segment, and penultimate except at base. Resembles *M. erythropyga*, Smith, but the red abdominal patch is larger, and the basal segments have no white hair-bands.

♂.—Length about 10 mm.

Face and front covered with bright rufo-fulvous hair; flagellum long and slender, black; anterior tarsi simple; anterior coxæ not spined; second and third abdominal segments with the hind margins narrowly reddish, and at sides covered with bright rufo-fulvous hair, forming narrow bands; red patch covering fifth segment, basal half of sixth, and apical two-fifths of fourth; apex (sixth segment) obtusely bilobed. Compared with *M. erythropyga* the head is smaller, the mesothorax more densely and minutely punctured, the b. n. falls short of t.-m. (in *erythropyga* they meet), the sixth abdominal segment is not distinctly concave above in lateral view, as it is in *erythropyga*, and the ornamentation of the abdomen differs in detail. It is also very close to *M. beutenmulleri*, Ckll., but may be separated by the ornamentation of the abdomen.

Hab. Mackay, Queensland; female (type), Nov. 1899; male, Jan. 1899 (*Turner*, 407). British Museum.

The sexes were associated by the collector.

Megachile ustulatiformis, sp. n.

♂.—Length about 13 mm.; width of abdomen 5.

Much more robust than *M. mystacea*; black; face and front densely covered with silver-white hair having a slight creamy tint; vertex with thin white hair; cheeks with mostly black hair, but light below; head broad; eyes large, dark reddish; mandibles broad, with three strong teeth, their broad outer surface with many minute punctures and some larger ones; antennæ black; vertex densely punctured, the punctures much larger at sides posteriorly; thorax with the hair entirely purplish black; mesothorax and scutellum with very distinct and strong punctures, the shining surface between very evident on disc of mesothorax; area of metathorax with a median raised line; tegulæ rufo-piceous, finely punctured. Wings strongly fuscous; second s.m. shorter than in *M. ustulata*. Legs black, with black and pale hair; anterior coxæ with long spines, but no bright hair-patches; anterior femora keeled below, the keel (except at base) and inner surface ferruginous; anterior tibiæ robust, trigonal, with the inner and lower sides, and apical margin of outer side narrowly, ferruginous; anterior tarsi ferruginous, moderately flattened, with an even fringe of pure white hair behind, and curled dark hairs on first joint in front, the anterior apices of joints produced; middle tarsi with fulvous hair on inner side, black on outer, and long white hairs behind; hind tibiæ rugose, shining, with short black hair on outer side and white tomentum on inner, the edge of the latter appearing as a narrow white band along the margin, when the tibiæ are seen from the side; hind tarsi with fulvous hair on inner side, and long creamy-white hairs in front, the basitarsus only moderately broadened; claws bidentate; spurs ferruginous; abdomen short and broad, covered above with rufo-fulvous hair (not so bright as in *mystacea*), the first segment with dark hair only at sides of basin; an appearance of darker apical bands on first three segments; apex (edge of sixth segment) broadly rounded, slightly crenulate, weakly emarginate in middle, with a depression or pit just in front of the emargination; no ventral spine.

Hab. Cairns, Queensland, "Kur. 1. 02" (*Turner*). British Museum. Mr. Turner took *M. ustulata*, Sm., ♀, and *M. mystacea* (Fabr.), ♂, also at Kuranda.

I do not think *M. ustulatiformis* can be the male of *ustulata*, because the female *ustulata*, agreeing perfectly with Smith's description and my notes from Smith's type, has the shining vertex with large widely scattered punctures. It also has the wings darker, the second s.m. longer and the marginal cell deeper than in *ustulatiformis*.

Megachile micrerythrura, sp. n.

♀.—Length 7 mm.

Not so robust as *M. abdominalis*; head and thorax black, abdomen red, the colour tegumentary; hair of head and thorax scanty, white, a little yellowish on vertex; mandibles black, tridentate, not very broad; clypeus and supraclypeal area shining but closely punctured; the disc of the broad short clypeus with a pair of low mammiform protuberances; flagellum dark reddish beneath; vertex, mesothorax, and scutellum very densely rather coarsely punctured; tegulæ very dark reddish. Wings clear, nervures and stigma reddish brown; legs black, with light hair, small joints of tarsi bright ferruginous; abdomen well punctured, with scanty short yellowish hair, not forming bands or spots; ventral scopa entirely creamy white.

Allied to *M. abdominalis*, but smaller and narrower, with proportionately longer eyes, and other differences. In size and shape it resembles *M. semicandens*, Ckll.

♂.—Looks like the female; face covered with shining white hair; anterior tarsi simple; anterior coxæ not spined; middle and hind tarsi and small joints of anterior ones red; thorax above with six white hair-spots, one at each corner of mesothorax, and two in scutello-mesothoracic suture; abdomen red, with the lower border of basin of first segment broadly black; apex (sixth segment) broadly emarginate or very obtusely bilobed (in *semicandens* it is bidentate); no ventral spine.

Hab. Port Darwin, Nov. and Dec. 1902, 1 ♀, 2 ♂ (*Turner*). British Museum.

The cheeks in the female are narrower than the eyes and rough; in *abdominalis* they are broader and shining. Superficially this species looks just like *Osmia semirubra*.

Megachile stalkeri, sp. n.

♀.—Length about 9 mm.

Of the parallel-sided type; head and thorax black; abdomen with the first two segments and extreme base of third black, the rest with the tegument deep chestnut-red, with scanty white pubescence. Head large and thick, longer than broad; vertex broad; cheeks nearly as broad as eyes; front and vertex strongly and closely punctured, shining between the punctures; much pure white hair at sides of face, and a tuft on each side extending over antennæ; scape black, red at end; flagellum bright red, black at apex above; mandibles black, thick; clypeal region extremely peculiar; a large blunt spine, directed obliquely downwards and outwards, projects from the supraclypeal area; sides of clypeus produced into broad outwardly-directed lamellæ, which are triangular and pointed; disc of clypeus shining, appearing deeply sunken between the great lamellæ, the excavation suboval in form; mesothorax and scutellum shining, with very strong well separated punctures; a conspicuous patch of white hair at each corner of mesothorax, but none in scutello-mesothoracic suture; area of metathorax strongly wrinkled basally; tubercles and sides of metathorax with much pure white hair; tegulæ dark reddish brown. Wings hyaline, nervures and stigma dark brown. Legs black, anterior femora and tibiæ largely chestnut-red in front; spurs yellowish white; second and third abdominal segments with a marginal patch of white hair on each side; ventral scopa entirely white.

Hab. Alexandria, N. Australia, Dec. 20, 1905 (*W. Stalker*).

Rather like *M. pararhodura*, but much smaller. The extraordinary clypeal structure is quite distinctive.

Megachile austeni, Ckll.

Mr. Turner took this at Mackay (Feb. 1900) and Cairns (Kur., 1. 02).

The Cairns specimen before me is larger than that from Mackay, but I do not know whether this is an individual or racial peculiarity.

Megachile quinquelineata, Ckll.

Mackay, Queensland, at flowers of heliotrope, Sept. 1899 (*Turner*); Cape York, April 1902, 2 ♀ (*Turner*).

Cape York is about 800 miles N.N.W. of Mack specimens from the two localities show no differen

Megachile detersa, sp. n.

♀.—Length 10 mm.

In all respects extremely close to *M. quinqueline* with the following differences:—Abundant hair of f posing only upper part of clypeus, which has larg distinctly separated punctures) pale yellow; eyes gre flagellum much longer (about 3½ mm.), obscurely red beneath; anterior femora with a large brush of white h beneath; outwardly directed tooth at end of anterior til smaller and more spiniform. Wings quite strongly dusl Apical dorsal segment of abdomen with fine appressed wh hair on disc; hind basitarsus small and short, hardly longer than the next two joints united; middle tarsi with a fringe of very long white hairs behind; anterior coxæ with short triangular spines; ventral scopa wholly absent, although the specimen seems quite fresh.

This remarkable specimen has many male characters although the abdomen is formed entirely as in all females with sting, &c. The antennæ are 13-jointed!

There can be little question that it is a very peculi gynandromorph (a result of hybridization?), but it was taken from a series in the Turner Collection supposed to be all the same.

Hab. Mackay, Queensland, Feb. 1900 (*Turner*, 458).

Aside from the gynandromorphic characters, this is e dently distinct from *M. quinquelineata*, though it may be a hybrid between *quinquelineata* and something else, perhaps *M. rhodogastra.*

Megachile rhodogastra, sp. n.

♂.—Length 11 mm.

Rather robust, but parallel-sided; black, with t ment of the sixth abdominal segment, the apical m the fifth broadly, and the ventral surface of abdo ferruginous; the fifth and sixth segments (exce middle of fifth narrowly) are covered yellowish hair, and also he Head broad; fa hair; clype and scutellum with black hair, but some white in between them and just behind tegulæ; much long behind scutellum, and a white tuft below tegulæ; pper part of pleura black, the rest white; tegulæ -fuscous. Wings strongly infuscated. Legs dark ous, with black and white hair, that on inner side of fo-fulvous; anterior tarsi simple, but rather thick; and middle tarsi with a fringe of long hair behind; outer side of hind tibiæ glittering white. Abdomen er short, the second and third segments constricted cally; first segment with white hair fringing the basin and ck hair just behind; first three segments slightly rufes-t, each with a very narrow, rather inconspicuous, apical ır-band, which widens laterally on first into a white patch, nd on the others into a large long-triangular patch, which is suffused with yellowish; similar patches are seen at sides of fourth segment; sixth segment rather obtusely bispinose.

Related to *M. rhodura*, Ckll., but much more robust, with the abdominal punctures less dense and very much smaller, he wings much darker, &c.

Hab. Mackay, Queensland, May 1900 (*Turner*, 624).

Localities of Mexican Bees.

In paper XXVI. of this series, I described certain Mexican bees in the Berlin Museum, the precise localities of which were in doubt. The following information received from E. Strand will help to elucidate the matter:—

(1) Ferdinand Deppe sent to the Berlin Museum in 1829 specimens from the following localities:—Temascaltepek; Real Ariba; Oaxaca; Vallereal; Rio Alvarado. Some of the bees, at least, were from Oaxaca, and very likely all came from there.

lphonse Forrer collected in the high plateau at 100 ft. in the vicinity of Durango, Mexico (Durango ty=Ciudad Durango). The citation California on labels is an error.

complanatus, *Brachydesmus superus*, *sabulosus*, and *Blaniulus guttulatus*. Con of the behaviour of these and related sp been given by a goodly number of write least convincing ones have found their way in books.

The Millipedes may be found wherever their sa flood and drought is secured, and where the soil is allow them to recede during extremes of heat a In general they feed on decaying matter, animal an table, though the Julids like fresh vegetables. *Glomeris* a preference for oak-plantations, while the Polydes *Blaniulus*, and *Atractosoma* are commonly found near h habitations, and are distinctly refuse-eaters. I have taken many as twenty Brachydesmids on a putrefying worm, while decaying rhubarb-leaves strewn in ditches will soon attract a gathering of *Blaniuli* if there happen to be any in the neighbourhood.

Most of the literature of a controversial nature has, however, been written in connexion with the breeding arrangements of these animals, and especially with the mode of construction of the nest and moulting recess so characteristic of the Millipedes. In these respects, as well as in anatomical structure, the Glomerids differ widely from the Polydesmids and Julids.

Glomeris limbata (=*marginata*).

The breeding-period extends from March till the end of July, but is subject to much variation, a late spring or the early advent of settled hot weather restricting the limits considerably. In spring *Glomeris* is usually found in couples, or perhaps still more commonly in threes—two males and one female. The male is much smaller than the female. The copulatory feet are the modified legs of the penultimate segment, while the female opening lies between the second pair of legs. Copulation takes place, as described by Humbert and vom Rath, by apposition of the pair in the head to tail position. As the male opening is situated on the second segment, a preliminary impregnation of the copulatory feet must take place.

Egg-laying is an interrupted process, and in nature the same female may lay her eggs in small groups in several places, ly thinly buried in the loose soil, and always under c moss or dead leaves. Neither in nature nor in ca e I seen the deep burying of the eg Rath. When an egg is about to b

on, her back, and the little egg is passed
gment to segment by the feet until it
f the body. There it is held immediately
n, and the rectum is everted to a considerable
form a mobile pad holding a small quantity
excrement. This is carefully plastered on to
urface of the egg and held there until the fluid
filters back into the intestine. As soon as the thin
xcrement is sufficiently firm, the egg is turned round
a small angle and the process repeated until the
egg is plastered over at least twice. In this way the
s enclosed in a shell about ½ mm. in thickness and
. in total diameter. When the case is complete, the
ale tilts it over to the ground, and may right herself or
roceed to lay and enclose another.

When the case is firm and dry the egg lies freely in a spherical chamber. Occasionally two or even three eggs are enclosed in one mass, but always in separate compartments. Vom Rath regards the egg-laying as a continuous uninterrupted process which follows in about three weeks or a month after a single act of copulation. It would seem, however, that in *G. limbata* at least the laying is done at intervals, with several intervening acts of copulation. After the laying the female pays no further heed to them. The young *Glomeris* make their way out of the case by eating a hole in it. In consequence of this many authors regard the case as a source of food for the young. This can only be an accidental use, as the shell is often made of excrement that is little better than earth plus a little glandular secretion. Comparison with the Polydesmids will show that the case serves a much more important economic purpose than the provision of a first meal in surroundings where food is plentiful.

Polydesmus complanatus.

The breeding-period is similar to that of *Glomeris*, though Fabre placed it in September. In this he was led astray by the discovery of coupled pairs in autumn. Copulation may take place in warm weather at any time of year, but no one has ever found eggs except in spring and summer.

The genital openings are on the third segment, and, unlike *Glomeris*, the copulatory appendages of *Polydesmus* take the
place of a pair of legs on the seventh segment. e male
approaches the female from behind, and runs a ie back
till the head is reached. Suddenly turnin, wards
ntral surface, he seizes the lower lip w

retaining this hold until the body of the female is for most of its length embraced in the broader grasp of the male. In marked contrast with *Glomeris*, copulation lasts a long time, usually two days or more, and takes place only once. One naturally couples this with the fact that the *Polydesmus* female also lays all her eggs at one time.

It is interesting to note that a fertilized female, when touched on the anal segment by a male, immediately darts forward and refuses to be caught. With a camel-hair brush the fertilized females in a collection can be readily recognized by touching lightly on the anal segment.

About three weeks intervene between fertilization and nest-building. Again, in striking contrast with *Glomeris*, the eggs of the Polydesmids are all enclosed in a common covering. This nest is a thin-walled, particularly well-made dome-shaped tent, surmounted by a narrow tubular chimney. The nest is built on a firm substratum—a stone, a leaf, the inside of an acorn-cup, or the inner surface of a piece of bark. In one respect, however, *Polydesmus* agrees with *Glomeris* and other Diplopods, viz. that the whole of the building-material passes through the gut, or, in other words, is composed of excrement made fluid with a secretion that hardens on exposure, and that the whole of the building is done by the very mobile surfaces of the extroverted rectum. A great deal of discretion is employed in the selection of a suitable building-site. If a stone is selected, the building is done on a spot with a slightly concave contour; if a smooth patch of firm soil or bark, then the female eats out a concavity in it.

The site being selected, the female bends itself into a circle and walks round and round, leaving a rapidly drying blob of excrement behind it as it goes, until the concave spot is surrounded by a rampart the circumference of which is slightly greater than the length of the animal. This rampart is built in such a way that a section across the edge would be roughly triangular in outline, being broad at the base and thinning off as it rises. The construction of the sides and roof demands far greater skill and precision, on account of the extreme tenuity and the graded roundness of the dome. For this purpose the everted rectum is no longer used as a trowel for plastering, but the blob of material is moulded, as if between finger and thumb, into a thin layer, and held in position, until it is sufficiently well fixed, by the two apposed sides of the rectal wall. Meanwhile the animal walks round the rim as before, adding new pieces as it goes, each piece slightly overlapping the one behind and below it, like tiles on a roof. When the nest has reached about two-thirds its full height the eggs are laid. For this purpose the animal lies across the nest, and the eggs drop in one after another, sticking together as they drop. Now the roofing-in alone remains to be done. The animal is no longer able to walk round the rim, the circumference of the circle being now much reduced. The head end of the animal accordingly walks round on the ground outside the nest and bites the soil or nibbles a leaf, while the anal region goes on with its delicate work on the rim. It is at this point that the extreme concentration of the building faculty in the hinder end comes most forcibly home to the observer. In this connexion it is necessary to mention a structure of obvious importance to the accuracy of the work, viz. the supra-anal process. This process, with its six tactile hairs, is lowered into contact with the rim before each new piece is placed in position. The central chimney is sometimes quite short, but in others it is the climax of the artistic effort, being narrow at the base and broadening out above into an excellent funnel.

This nest is not always built in one shift, but is always completed once the eggs are laid. When the nest is finished the female does not leave it immediately, but remains coiled round it for about a week, and is often difficult to remove. Oftentimes it also covers it up with bits of leaves and wisps of grass, which, if removed, it will replace over and over again.

The nest of *Brachydesmus* resembles that of *Polydesmus*, but is much smaller and more conical.

The Julidæ.

The Julids begin their breeding rather later in the year than the Polydesmids. Neither in captivity nor outside have I seen nest-building started before the end of May or the beginning of June. Their mode of copulation is similar to that of the Polydesmids; but in their nest-building methods they differ in several very striking and significant points. It is true that the eggs of the Julids are all laid together in one enclosure and at one time; but the nest is a very crude structure compared with that of *Polydesmus*, and the building instinct is of a much lower order. The most striking point of contrast, however, is the fact that the Julid nest is mainly built from the inside, the top only being laid on from the outside.

The female burrows into the loose soil until it comes to a firm foundation, usually a stone, where it proceeds to make a dome-shaped clearing, the shaping being done by the jaws.

This space is then plastered from the inside with liquid excrement by means of the everted rectum, the animal meanwhile having to assume some very uncomfortable positions during the process. On emerging from the recess the female pushes its way into a position astride the open top and lays its eggs. The subsequent closing of the hole in the top was not observed, but examination of the completed nest showed that it was made rather loosely from bits of cemented earth. The females observed paid no further attention to the nest. The method described above is employed by all three Julids, and was most easily made out in the case of the large *J. sabulosus* building against the bottom of a glass vessel.

The account here given is unfortunately incomplete for the British Millipedes, because the Chordeumidæ are quite unrepresented, but owing to the ravages of white moulds and minute Mermithidæ, the writer has never succeeded in keeping either *Craspedosoma* or *Atractosoma* alive in captivity long enough to cover the breeding-period.

Moulting.

The procedure during moulting is so closely related to that of nest-building that it may well be considered here.

With regard to *Glomeris*, I agree with Hennings, in opposition to Verhoeff and vom Rath, that the animal seeks no special protection during moulting, but does it in some loose earth or on the surface under the moss or dead leaves. In spite, however, of Hennings's assertion to the contrary, the moulted *G. limbata* is most certainly pale at first, but may remain in the old case long enough to develop the dark tint of the normal animal.

The case of the Julids and Polydesmids is very different, and in both the moulting animal secretes itself in a recess identical in its mode of construction with the nest built by the female *Julus* for its eggs, *i. e.* it is a dome-shaped recess plastered from within. In it the animal lies for some time after the moulting in a perfectly motionless and helpless condition, scarcely responding even to the prick of a pin.

These observations place the nest of *Julus* on a plane with the moulting recesses of both *Julus* and *Polydesmus*, while raising the Polydesmid nest to a plane altogether superior, demanding a faculty not possessed by the Julids nor by the males of its own species.

The reason for the exceeding care taken to guard the eggs and the helpless animal during moulting is suggested by

Mr. F. G. Sinclair, in his account of the cannibalistic proclivities of the male *Lithobius* in his article on the Myriopoda in the 'Cambridge Natural History.' In order to test the applicability of this accusation to the Millipedes, I placed a stone bearing three nests of *Polydesmus* in a vivarium containing a number of adult animals. No notice whatever was taken of the nests until a portion of the roof of one of the nests was removed, when the first male that wandered that way entered and devoured the whole contents of the nest. The same result was obtained several times with injured nests, and the cannibal was always a male, the females not attacking the eggs even when offered to them. Nor does the male *Polydesmus* pay any attention to the eggs of *Julus* strewn in its path. Exactly the same result was obtained by placing an injured moulting recess in the way of the male of the same species as the occupier. The helpless moulter was invariably eaten up. It is rather curious that even in this instance the female should be guiltless. Experiment showed that *Glomeris* shared this universal cannibalism of the male.

It should be mentioned that the account here given is in several respects in disagreement with the observations of some other writers. The use of fluid excrement in the construction of the egg-coverings was mentioned by von Schlechtendal for *Polydesmus* and by Humbert for *Glomeris*. Vom Rath stoutly denies this, without, however, giving any alternative account of the mode of procedure. He admits that a rectal secretion is used, but it is for the cementing together of grains of soil. Unfortunately he does not explain how the grains of soil come to lie handy, as in the case, *e. g.*, of a *Glomeris* lying on its back. For the disproof of what he calls the Humbertian hypothesis he relies partly on chemical experiment. The substance of the nest gives effervescence with acid. This is, however, only natural, since the female eats leaves and soil indiscriminately during the laying period. Microscopic examination shows that one *Glomeris* egg-case is largely made up of soil, while another is composed entirely of triturated leaves. In any case careful observation of the species here mentioned shows that the whole of the building-material comes directly from the intestine.

One essential condition for the accurate observation of the behaviour of the Millipedes is to accustom the animals to moderate light for some time before the observations are made. Vom Rath and others warn us that the Millipedes must be kept in semi-darkness. These animals, however, soon get over their shyness and behave quite naturally in light of moderate intensity, and it is then alone that their doings can be watched with closeness and accuracy.

Mr. Sinclair, in the article already quoted, expresses the desirability of re-investigating the breeding-habits of the Myriopods, and prophecies that a full inquiry would help to answer some still unsolved Myriopod problems. Whether this is partially fulfilled or not, two things stand out clearly, viz. that the Glomeridæ, in so far as their breeding-habits are concerned, are separated by a wide gap from the other Millipedes examined, and that the Polydesmidæ have improved on the Julidæ in nest-building methods while retaining the cruder Julid type of moulting recess.

My gratitude is due to Mr. Sinclair for the instigation to begin these observations and for advice during their conduct.

XXXI.—*African Gerbils of the Genera* Tatera *and* Taterillus. By R. C. Wroughton.

In an instalment of the Rudd Collection recently made by Mr. Robin Kemp at Voi in British East Africa were specimens of three—if not four—forms of Gerbils belonging or closely related to the genus *Tatera.*

In drawing up my key to the genus (Ann. & Mag. Nat. Hist. 1906, xvii. p. 475), I unfortunately overlooked two species described by Peters from this part of Africa. The descriptions are very meagre, but one of them deals with such a strongly marked species that there can be no doubt that it refers to one of the present forms of which the following is a fuller description.

Tatera nigricauda, Peters.

Size greater than that of any known African *Tatera.* General colour above blackish "cinnamon," paling to "ochraceous buff" on the flanks; individual hairs of the back basally "slate-grey" for two-thirds (10 mm.) their length, remaining third made up of a subterminal buff ring and a black tip; below pure white, the hairs white to their bases. Face between the eyes coloured like back, cheeks like flanks; a pale, almost white, patch between eye and base of ear. Hands and feet white. Tail rather thickly clothed with black hairs, equally so above and below, throughout its whole length.

Skull large and stout, supraorbital ridges very strongly marked and continued backwards along sides of brain-case to meet the almost equally well-marked lambdoid ridge. Posterior palatal foramina long, longer than in *valida*, &c., about as in *dundasi*.

Dimensions of an adult male (measured in the flesh) :—

Head and body 193 mm.; tail 208; hind foot 41; ear (22).

Skull: greatest length 52; basilar length 40; zygomatic breadth 27; nasals 24; least intraorbital breadth 9; brain-case breadth 19; diastema 15; anterior palatal foramina 9·5; posterior palatal foramina 3; upper molar series 7; bullæ 14.

Mr. Kemp obtained a fine series of 27 specimens of both sexes and all ages. In any key to the genus *Tatera* this remarkable species would occupy a section by itself, characterized by its uniformly black tail; in all other known species the tail is either dark above and pale below, as in all African forms, or dark above and below and pale at the sides, as in the Asiatic.

Peters's second species, which I overlooked, is *T. vicina*. There is a specimen from the type locality—Kitui—in the National Collection, which may be accepted as representative of that species. In my monograph (*l. c.*) I described *T. mombasæ* from Mombasa. These two forms are undoubtedly closely related, if not identical. With such a meagre description and only one, not very good, specimen, it is not possible to come to a reliable conclusion. *T. vicina* seems to have a well-marked tail-tuft, while *mombasæ* has a longer, more tapering tail with no long hairs towards the tip. Both these forms are represented in the Voi collection.

Finally, when my key was prepared, *T. emini*, characterized by a band of hairs across the sole of the foot, immediately behind the hallucal pad, occupied a section by itself. Since then other species with this character have been described, and quite recently (Ann. & Mag. Nat. Hist., Aug. 1910, p. 222) Mr. Thomas has established the genus *Taterillus* to receive them. There is a new form among the Gerbils from Voi, and in comparing it with specimens from the Nile Valley it appears that a series of specimens obtained at Dug-dug in the Bahr-el-Ghazal by Mr. A. L. Butler represents a form distinct from *emini*, its near neighbour.

Thus there are now six species known of the genus *Taterillus*, which may be arranged in a key as follows:—

A. Size larger.
  a. Colour darker.
    a′. Head and body 140 mm.; hind foot 30; skull length 36; brain-case 14; upper molars 5·2. General colour "Mars-brown." (Wadelai.) .... *Taterillus emini*, Thos.

b'. Head and body 120 mm.; hind foot 29; skull 34; brain-case 15; molars 5. General colour "vinaceous cinnamon." (Bahr-el-Ghazal.) .... *T. butleri*, sp. n.

c'. Head and body 120 mm.; hind foot 31; skull 36; brain-case 16; molars 5. (B. E. A.) .... *T. osgoodi*, sp. n.

b. Colour paler. Head and body 120 mm.; hind foot 30; skull 37; brain-case 14·5; molars 5·2. General colour "ochraceous buff." (Lake Chad.) .... *T. lacustris*, Th. & Wr.

B. Size smaller.

a. Head and body 100 mm.; hind foot 28; skull 31; brain-case 14; molars 4·5. General colour "clay colour." (Lake Rudolf.) .... *T. harringtoni*, Thos.

b. Head and body 92 mm.; hind foot 29; skull 32; brain-case 14; molars 5·1. General colour Mars-brown. (Gambia.) *T. gracilis*, Thos.

Taterillus osgoodi, sp. n.

A *Taterillus* about the size of *T. emini*, distinguished by its darker colouring and broader stouter skull.

Size about as in *T. emini*. General colour above ferruginous russet, becoming more purely ferruginous on the flanks, individual hairs blackish slate basally (10 mm.), then ferruginous (2·3 mm.), with a sharp black tip; below pure white. Hands and feet white. A band of a few scattered short pale hairs across the tarsus behind the hallucal pad. Proximal half of tail clothed with short ferruginous hairs, darker above, paler below, distal half furnished (especially above) with long (10 mm.) blackish-brown hairs forming a long tuft.

Skull of the same size as in *emini*, but much broader and stouter, the characteristic long posterior palatal foramina fairly well developed.

Dimensions of the type (measured in the flesh):—

Head and body 117 mm.; tail 150; hind foot 31; ear 17·5.

Skull: greatest length 36·5; basilar length 27; zygomatic breadth 18; nasals 15; least interorbital breadth 6; brain-case breadth 16·5; diastema 10; anterior palatal foramina 5·5; posterior palatal foramina 4; upper molar series 4·8; bullæ 10·3.

Hab. British East Africa (Type from Voi. Alt. 2000'.)

Type. Adult male. Rudd Collection. Original number 958. Collected on 16th April, 1910.

Mr. Kemp sent a series of seven specimens.

Taterillus butleri, sp. n.

A *Taterillus* rather smaller and more brightly coloured than *T. emini*.

Size rather smaller than *emini*. General colour above "vinaceous cinnamon," paling on the flanks to "pinkish buff," on the lower back a reddish suffusion amounting almost to hazel; below pure white. Hands and feet white. Tail coloured like back, paler below, distal half clothed with long (10 mm.) dark brown hairs.

Skull shorter and broader than in *emini*.

Dimensions of the type (recorded by the collector):—

Head and body 120 mm.; tail 150; hind foot 29; ear 18.

Skull: greatest length 35; basilar length 27; zygomatic breadth 18; nasals 15; interorbital breadth 6·5; brain-case breadth 15; diastema 10; upper molar series 5; anterior palatal foramina 6; posterior palatal foramina 4·5; bullæ 9.

Hab. Bahr-el-Ghazal. (Type from Dug-dug.)

Type. Old female. B.M. no. 8. 4. 2. 17. Collected by Mr. A. L. Butler on 19th January, 1907.

Mr. Butler sent two series, viz.: one, from Raffile on the Sueh River, due south of Wau, collected in February 1908, which is not distinguishable from *T. emini*; while the other, obtained in January 1907, at Dug-dug (8° N. and 28° E.) considerably north of Wau, represents the present species.

XXXII.—*Preliminary Diagnosis of a new Stomiatid Fish from South-west of Ireland.* By E. W. L. Holt and L. W. Byrne.

The specimen before us was taken by Messrs. Farran and Kemp in a shrimp-trawl fished from the 'Helga' on 12th November, 1909, at Station S.R. 858, 51° 20′ N., 11° 56′ W., off the south-west coast of Ireland. The soundings were 736 fathoms, but the net never touched bottom, and probably did not go deeper than 700 fathoms.

It is closely allied to the West-Atlantic *Grammatostomias dentatus*, Goode and Bean ('Oceanic Ichthyology,' 1895), from which, however, as also from any other fish of which we have seen a description, it is at once distinguished by a most conspicuous pale band, which forms a closed loop on the anterior half of each side of the body. The fish has, moreover, a slender simple hyoid barbel about six times as long as its body.

Both *G. dentatus* and the species below described are known from single specimens only, and under these circumstances we think it better not to create a new genus for the reception of the Irish fish, but to so modify the existing definition of the genus *Grammatostomias* as to include both the latter and *G. dentatus*.

The great liability to injury of a long and slender barbel makes the presence of such an organ an unsatisfactory character for use in generic definition; the structure of the pectoral fins in *G. flagellibarba*, while apparently unique, cannot be accurately described, and the very singular, probably luminous, looped band of the last-named species may possibly be present in one sex only, like certain luminous organs in some Scopelids. Apart from the pectoral and the band there seems to be very little difference between *G. dentatus* and *G. flagellibarba*.

The genus *Grammatostomias* may be redefined as follows:—

GRAMMATOSTOMIAS.

Form compressed and moderately elongate. Dorsal and anal with numerous rays opposite each other and near the caudal. Pectorals present, set very low. Ventrals set at about the middle of the total length without the caudal, but nearer to the head than to the caudal. Caudal with the dorsal lobe shorter than the ventral. Eye not longer than the snout. Teeth in the jaws widely separate and fang-like, an anterior fixed pair in each jaw followed by several smaller fixed teeth and by a few depressible teeth situate a little internally to the fixed teeth. Vomer toothless. Hyoid barbel very long and simple. Skin without scales. Two rows of small photophores on the sides below the middle line.

Grammatostomias flagellibarba, sp. n.

Length of head about 5⅓ in total length without caudal fin and a little greater than greatest height of body, which is about twice its greatest width. Eyes shorter than snout, about 8 in length of head and 2¾ in width of interorbital space.

Teeth * slender and very sharp, their bases closely surrounded by the black epidermis. Those in upper jaw almost uniserial; a non-depressible tooth about as long as eye at each side of symphysis, this is followed by a much longer depressible tooth and one or two smaller depressible teeth on each side, all of which are in a line slightly internal to two smaller non-depressible teeth which lie in the intervals between the depressible teeth; the posterior end of the maxilla is rough with minute teeth in a single series. On the mandibles there are anteriorly and corresponding to the anterior teeth in the upper jaw a pair of long non-depressible teeth; behind these there are six depressible teeth diminishing somewhat in size backwards, and two non-depressible teeth lying in a line slightly external to the depressible teeth and situated behind the first and third teeth of the depressible series; the points of the non-depressible teeth are somewhat outwardly directed.

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* Some individual variation in the dentition may be reasonably assumed.

Hyoid barbel stout basally, produced into a slender filament many times longer than the body. Pectorals placed close together near the ventral margin, apparently devoid of any large detached ray, two of the rays short and fleshy, the remainder, of which one is anterior to the fleshy rays, slender*. Ventrals with about 7 slender rays, set a little nearer to the snout than to the caudal fin, their length about equal to the height of the body at their point of insertion. Dorsal with about 20 rays, its base a little shorter than the greatest height of the body. Anal with about 22 rays, its base a little longer than the greatest height of the body; both fins with comparatively short rays set in rather conspicuous fleshy bases.

Height of caudal peduncle less than the length of the snout. Skin black, rather thick, with barely perceptible granulations †. A group of grey specks (looking like fungoid growths) at the hind angle of the gill-cover, and another group below the origin of the band mentioned below. Other and smaller grey specks sporadically scattered over the lower parts of the cheeks and the fore part of the body. A thin band (of matter similar in appearance to the specks above mentioned and raised above the skin after the manner of a scar or cicatrix), forming a long loop with acute posterior angle ‡, extending beyond the vertical from the insertion of the ventrals, its lower limb wider and boldly sinuous at its origin, the rest narrow and feebly sinuous. A large photophore behind and slightly below the eye, occluded by skin save for a narrow slit. A row of very small photophores, hardly visible externally, below the middle line of the side from the head to the caudal peduncle; another row near the ventrum, from the thoracic region to the anus. Colour velvety black; looped band purplish grey; barbel grey.

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* The fleshy rays are at present colourless, but may have lost their integument. The original condition and number of the slender rays is beyond conjecture. They are now represented by a few hair-like processes, which may be either the true rays or portions thereof divided by fission.

† The faint vertical markings present in allied Stomiatids did not become apparent until the fish had been preserved in alcohol and formalin for some weeks.

‡ On one side there is a very short process posterior to the angle.

Total length without caudal fin and lower jaw (in type) 172 mm.

We are indebted to our friend Professor MacBride for sections of a part of the looped band. Preliminary examination shows a cord of apparently glandular tissue, oval in section, covered with a thin membrane and lying in a groove of the skin, of which the black pigment is continued throughout the groove. We find nothing in the structure to suggest that the band is a lateral line, though its position suggests a derivation from that organ, which in its ordinary form is absent from both species of *Grammatostomias*. We have ascertained from the authorities of the U.S. National Museum and Dr. Brauer that the type of *G. dentatus* and the material of closely allied forms taken by the 'Valdivia' are sufficiently perfect to make it certain that none of them possessed any structure in the nature of the looped band, which appears to be a luminous organ.

XXXIII.—*The British Roe-deer* (Capreolus capreolus thotti), *a preliminary Diagnosis*. By Dr. EINAR LÖNNBERG, C.M.Z.S. &c.

A FEW years ago my friend Count Tage Thott mentioned to me that he had seen some British Roe-deer which appeared to him to be different to the Swedish which constitute the type of Linnæus's species.

During a sojourn in London this summer I had the opportunity of ascertaining the correctness of Count Thott's observation by studying, with the kind permission of Mr. Oldfield Thomas, the material of British Roe-deer in the British Museum Nat. Hist. I am thus able to give the following short preliminary diagnosis, and hope to have the opportunity in the near future to publish a more complete description accompanied by some figures.

The British Roe-deer, which appears to be somewhat smaller and to have smaller antlers, is a very much darker animal all over than the Swedish, and it has a more blackish face and blackish ears. As type for the new subspecies I propose no. 8. 11. 22. 1 in Brit. Mus. Nat. Hist., from Aberfeldy. In winter pelage the whole face and the sides of the head are blackish. The nose is sprinkled with whitish tips to some hairs; especially on a spot above the rhinarium, these light-tipped hairs are more numerous, and the sides of the head grizzled with longer buffish tips to the hairs. On the forehead the black ground-colour dominates, but is somewhat sprinkled with buff tips. The ears are mixed black and buff—more black at the tips, more buff basally. The neck and the back are dark brown, the visible parts of the hair being blackish with rings of a rich buff, sometimes inclining to rufous. The basal, not visible, parts of the hair are dark grey, much darker than in Swedish specimens. The sides of the body are not quite so dark as the back, the ground-colour being somewhat paler and the rings paler buff. The throat behind the white chin-spot is buffish, lighter in the middle. The lower side of the neck is buffish grey, not coarsely sprinkled as in Swedish specimens. The lower side of the breast is grey, darker and less buffish than in Swedish specimens. The black nose-mark and the speculum as usual, although the latter seems to be smaller than in Swedish specimens. The fur all over the body is not so long nor so coarse as in Swedish specimens.

In summer pelage the British Roe-deer has a black patch on the forehead surrounded by rufous and somewhat sprinkled with the same colour. The ears have broad blackish margins and are otherwise mixed with buffish. The upper neck and back are very rich rufous, the sides of the body somewhat paler, and the lower parts still lighter; the throat behind the white chin-spot pale buff, the belly almost whitish.

XXXIV.—*Description of the Indian Butterfly* Parantirrhœa marshalli, *W.-M.* (*female*). By Lieut.-Colonel N. MANDERS, F.E.S.

THE male was described by Wood-Mason in 1880 from a male specimen captured by Mr. Harold Ferguson in the Ashamboo Hills in May. The female is not noticed by Bingham ('Butterflies of India,' vol. i. 1905), and a description would therefore appear to be necessary, as it is evidently unknown.

Expanse 2·2 inches (55 mm.).

Upperside fuscous; an irregular, ochreous, somewhat circular spot on costa beyond the cell extending to the second discoidal nervule, partly surrounded, particularly at the outer portion, by pale shining violet. A discal series of five small white spots in interspaces 2–6, followed by a waved submarginal pale ochreous line extending the whole length of termen.

Hind wing fuscous; a small white spot in interspaces 2–4 on the disc, a continuation of those on the fore wing; the ochreous submarginal line extends from costa to possibly anal angle (the specimen is too worn for certainty).

Underside: both wings pale ochreous, with minute darker striæ; a somewhat darker ill-defined basal and discal band crossing both wings; a submarginal series of inconspicuous brown specks.

Antennæ ochreous brown; thorax and abdomen the same colour as the wings.

The specimen is unfortunately in very bad condition, but there is no appearance of the deep violet suffusion of the male.

Mr. Wood-Mason's conjecture that the venation of the female would, unlike the male, conform to the generality of butterflies is confirmed.

I am indebted to Mr. Williams Hockin for the loan of the butterfly for description; he informs me that it is found in Travancore at the foot of the hills, or between that and 3000 feet. "It is only found on *Itah* (small hill bamboo) in drizzly weather in October."

It is evidently very rare.

XXXV.—*Descriptions of Five new Species of Ticks* (Ixodidæ).

By Stanley Hirst and L. F. Hirst, M.D.

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Amblyomma darwini, sp. n.

♂.—*Scutum* oval in shape, longer than broad, and narrowed anteriorly. Cervical grooves deep, fairly long, and slightly divergent posteriorly. In line with and at some distance behind each of the cervical grooves there is a small oval impression, and a little to the outer of this impression a pair of similar impressions is present. Postero-median groove long, straight, and not very deep; anteriorly it is almost confluent with a small but rather deep circular pit. Postero-lateral grooves deep at the anterior end, fairly long, and broader than the postero-median. Punctures numerous, small, and mostly subequal in size; towards the sides, however, they are a little larger than elsewhere. Eyes pale and very slightly convex (fig. 1).

Fig. 1.

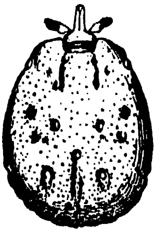


Fig. 2.

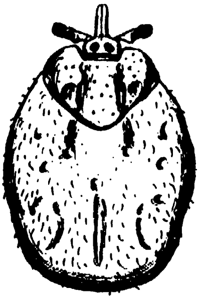


Fig. 1.—*Amblyomma darwini*, ♂. Dorsal view, × 10.
Fig. 2.— „ „ ♀. „ „ × 8.

Ventral surface furnished with numerous rather superficial punctures. *Stigmata* elongate and almost comma-shaped.

Rostrum short, its base almost smooth above. Hypostome with three files of teeth on each side. Dorsal surface of the second segment of the palp towards the middle with a distinct prominence (which is also present in the female).

Legs of moderate length. Coxa of first leg armed with two small spurs; coxæ of legs 2–4 each with a single small conical spur, that of the fourth being the longest. Tarsus of fourth only slightly convex dorsally and furnished with two terminal spurs below.

Colour deep brown above, dirty yellowish-white below.

Measurements in mm.—Length of scutum 2·56, its greatest breadth 2·12; length of rostrum ·64.

♀.—Body oval in shape and furnished with a number of depressions, which much resemble those of the scutum of the male. Numerous pale-coloured hairs are present, which are comparatively slender and of small size.

Scutum wider than long and heart-shaped. Cervical grooves short. A second pair of deep and rather large grooves is present behind and in line with the cervicals, and sometimes almost continuous with them; on each side of this posterior pair of grooves there is a lateral impression, which is well marked in some examples, but indistinct in others. Punctures fairly numerous, but not very deep, and rather unequal in size (fig. 2).

Stigmata almost comma-shaped.

Rostrum rather short. Porose areas deep and oval in shape. Hypostome with three files of teeth on each side.

Legs.—Armature of the coxæ of the legs similar to that of the male. Tarsus of fourth leg of different shape to that of the male; it is stout, rather strongly convex dorsally, and the slope is long but not very steep, the apex being narrowed.

Colour.—Body dark brown above, the ventral surface yellowish-brown. Scutum very dark brown, with irregular pale patches (which are only visible in the dry examples). Legs the same colour as the scutum and with the distal ends of the segments ringed with white.

Measurements in mm.—Length of body 4, width of body 2·75; length of scutum 1·12, width of scutum 1·6; length of rostrum ·9.

Material.—Three males (one of which is the type) and two females, found on an *Amblyrhynchus cristatus* from Albemarle Island, Galapagos. Three females (and also several nymphs and larvæ) from an *Amblyrhynchus cristatus* labelled Galapagos (exact locality not given). Two dry female specimens from St. Paul's Island, which were collected by Charles Darwin, and two dry females labelled Galapagos, also collected by Darwin.

Remarks.—The specimens collected by Darwin were identified by Prof. Neumann as *A. hirtum*, Nn. The male of *A. darwini*, sp. n., is very unlike that of *A. hirtum* (*cf.* Neumann's fig. and our fig. 1). The scutum of the female of *A. darwini* is very much smoother than that of *A. hirtum*, and the punctures are not so deep and are further apart. We may remark here that all the specimens of *A. hirtum*, Nn., were collected by Darwin; according to his labels both the species under discussion occur on St. Paul's Island.

Amblyomma boulengeri, sp. n.

♂.—*Scutum* longer than wide, and slightly narrowed anteriorly. Punctures numerous and very fine. Anterior part of cervical grooves deep and slightly curved; posterior part very slight and inconspicuous, divergent from that of the opposite side, and extending as far backwards as the postero-lateral margin of the pseudoscutum (see *Colour*). A pair of characteristic oblique impressions, partly formed of enlarged punctures, are present posteriorly, one on each side of the scutum; their shape resembles somewhat that of a comma, the broad end being situated close to the margin (near to the anteriormost festoon and almost touching the upper end of the stigma), the narrowed end pointing inwards and connected by a dark and narrow line (and sometimes by an ill-defined depression also) with the posterior margin of the pseudoscutum. Postero-median groove represented by a smooth dark line. Marginal grooves are not present. Festoons short and fairly well defined. Eyes small, flat, and pale in colour (fig. 3).

Fig. 3.

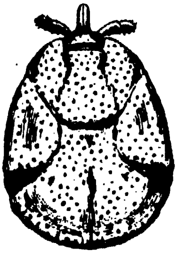


Fig. 4.

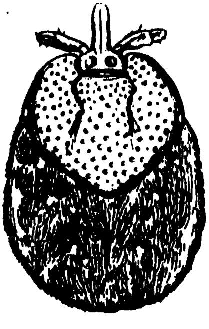


Fig. 3.—*Amblyomma boulengeri*, ♂. Dorsal view, × 16.
Fig. 4.— ,, ,, ♀. ,, ,, × 13.

Ventral surface finely wrinkled. *Stigmata* long, narrow, and shaped like a comma.

Rostrum short; its base rectangular, the dorsal surface being furnished with a number of minute punctures. Hypostome with three files of teeth on each side.

Legs short. Coxa of first leg with two short and inconspicuous spurs; coxæ of second and third unarmed (or with a single very short spur); coxa of fourth with a single very short spur. Tarsus of fourth rather gradually narrowed.

Colour.—A pseudoscutum, which is light brown in colour in dried specimens and copper-coloured when immersed in spirit, is present, and the central part enclosed by the cervical grooves is sometimes darker than the sides; its posterior margin is delimited by a pale transverse line. The rest of the surface of the scutum is drab (in spirit copper-coloured).

A brown speck is present above each eye and a very short dark longitudinal mark on either side of the pale transverse line, a minute central speck being present between these two. The postero-median groove and the oblique lateral depressions are also dark in colour.

Measurements in mm.—Length of scutum 1·75, its greatest breadth 1·4; length of rostrum ·47.

♀.—*Body* oval; the part of the dorsal surface which is left uncovered by the scutum is furnished with numerous short and stout drab-coloured hairs.

Scutum cordiform. Punctures numerous, fairly deep, and subequal in size. Cervical grooves well-defined and coming to an end at some distance from the posterior margin. Eyes small, flat, and inconspicuous; they are yellowish in colour (fig. 4).

Stigmata comma-shaped.

Rostrum.—Porose areas well-defined and oval in shape; they are separated from one another by an interval which is about equal to their diameter. Hypostome with three files of teeth on each side.

Legs short. Coxa of first leg with two short spurs; coxæ of legs 2–4 each with a single very short spur. Tarsus of fourth leg stouter and not so gradually narrowed as that of the male.

Colour brownish, the hairs of the body drab-coloured. Chitin of scutum dark brown, but covered with a thin layer of pale enamel.

Measurements in mm.—Length of body 2·5, its greatest breadth 2; length of scutum 1·26, its greatest breadth 1·53; length of rostrum ·86.

Material.—Two males (one of which is the type) and a female, from a *Tropidurus delanonis*, captured on Hood Island (Galapagos).

A large partially distended female, which probably belongs to this new species, was found on a *Tropidurus barringtonensis* from Barrington Island. It agrees closely with the female from Hood Island in most respects, but the body and legs are much paler in colour, the punctures of the scutum closer together, and its posterior end more rounded off. Another female, taken on a *Conolophus subcristatus* from the Galapagos (exact locality not given), is very similar to that from Barrington Island.

Remarks.—We have much pleasure in dedicating the new species described above to Mr. G. A. Boulenger. It is owing to his kindness that we have been enabled to examine most of the species which are described in this paper.

In the British Museum collection there is a large distended female tick from the Lake of Chalco, near Mexico, which has been determined by Prof. Neumann as *Amblyomma pilosum*, Nn. (originally described from the Galapagos). It differs from the female of *A. boulengeri* in having the scutum triangular in shape and much rougher, the punctures being larger and closer together. Moreover, the stigmata are somewhat different in shape.

Amblyomma nitidum, sp. n.

♂.—*Scutum* longer than broad and oval in shape; its surface smooth, shining, and furnished with numerous very minute punctures, those which are placed near to the lateral margins being a little larger than those in the middle. Cervical grooves normal in appearance, the superficial posterior part short. Postero-median groove represented by a faint dark line. Postero-lateral grooves present, but ill-defined. Marginal grooves represented by very ill-defined and superficial depressions, which come to an end in front of the anteriormost festoon. Eyes minute and almost invisible (fig. 5).

Fig. 5.

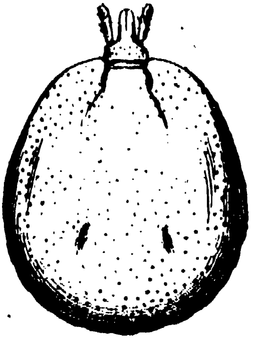


Fig. 6.

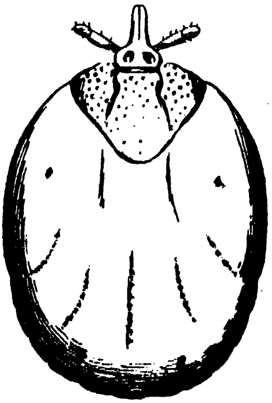


Fig. 5.—*Amblyomma nitidum*, ♂. Dorsal view, × 9.
Fig. 6.— „ „ ♀. „ „ × 8.

Ventral surface much furrowed and pitted, especially posteriorly. *Stigmata* very broad and roughly triangular in shape. *Rostrum* of moderate length, the base finely punctured above. Hypostome armed with four files of teeth on each side.

Legs.—Coxa of first leg armed with two very short spurs, coxæ of the other legs each with a single very short spur, that of the fourth being a little longer than those of the second or third. Tarsus of fourth not very abruptly narrowed.

Colour deep brown both above and below, the legs pale brown.

Measurements in mm.—Length of scutum 4·1, its greatest breadth 3·5; length of rostrum 1·08.

♀.—*Body* oval in shape.

Scutum roughly triangular in shape, but the sides are slightly incurved at the points at which the cervical grooves reach them, and this causes a slight trilobation. Posterior angle obtuse. Punctures numerous, those in the central area (marked off by the cervical grooves) being a little smaller than those of the sides. Cervical grooves well-defined and reaching the postero-lateral border. Eyes very inconspicuous (fig. 6).

Stigmata broad and shaped rather like a human ear.

Rostrum fairly long; the porose areas oval and of rather large size. Hypostome with four files of teeth on each side.

Legs.—Spurs of the coxæ of the legs very weak; in number they are the same as in the male. Tarsus of fourth leg very similar to that of the male.

Colour.—Body brownish, scutum deep brown, legs pale brown.

Measurements in mm.—Length of body 5·2, its greatest breadth 4; length of scutum 1·45, its greatest breadth 2·03.

Material.—A male and a female collected on a sea-snake in the Solomon Islands by Staff-Surgeon Vidal Sharpe, R.N.

Amblyomma (*Aponomma?*) *neglectum*, sp. n.

♂.—*Scutum* a little longer than wide, narrowed anteriorly, and oval in shape; its surface smooth and shining, but slightly depressed and uneven towards the sides in the anterior half. Punctures very numerous, especially in the posterior half and towards the margins, some of those which are situated close to the margins being of larger size than the others; in the middle of the anterior part of the surface the punctures are minute and fewer in number. Cervical grooves very short and shaped like an inverted comma. Marginal grooves absent. Postero-median groove represented by a dark unpunctured line. Postero-lateral grooves in the form of slight oval depressions. Festoons short and not very distinct. Eyes apparently absent (fig. 7).

Ventral surface furnished with numerous distinct punctures.

Stigmata comma-shaped.

Rostrum fairly long, the base sparsely punctured above. [Hypostome broken.]

Legs.—Coxa of first leg armed with two short spurs; coxæ of legs 2–4 each with a single short spur, that of the fourth being the longest. Tarsus of fourth leg stout and furnished with a dorsal hump, sloping rather steeply to the narrowed apex; ventral surface of the tarsus with two spurs, the apical one being well-developed.

Colour.—Ground-colour of scutum deep mahogany-brown. A minute spot of metallic green is present on each of the scapulæ, and a fairly large median spot of the same colour is also present at about a quarter of the length of the scutum from the anterior emargination.

Measurements in mm.—Length of scutum 3·3, its greatest breadth 3·2; length of rostrum 1·11.

♀.—*Scutum* wider than long and heart-shaped. Punctures numerous and mostly fairly deep, but those in the posterior angle are superficial. Cervical grooves rather large and comma-shaped; they are continued posteriorly by shallow and ill-defined depressions. Eyes pale, flat, and inconspicuous (fig. 8).

Fig. 7.

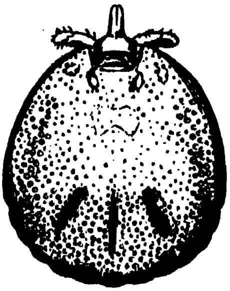


Fig. 8.

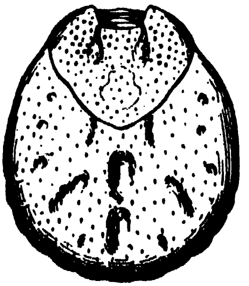


Fig. 7.—*Amblyomma* (*Aponomma?*) *neglectum*, ♂. Dorsal view, × 9.
Fig. 8.— „ „ „ ♀. „ „ × 9.

Ventral surface smooth; the punctures and hairs are minute and inconspicuous.

Stigmata small and comma-shaped.

Rostrum.—Porose areas large, oval, and separated from one another by an interval which is greater than their diameter. [Hypostome broken.]

Legs.—Coxa of first leg with two very short spurs; coxæ of legs 2–4 each with a single short spur, that of the fourth being slightly the longest. Tarsus of fourth leg closely resembling that of the male.

Colour.—Body brownish. Scutum deep brown and with a large metallic spot at a short distance from the posterior angle. Traces of metallic coloration are also present on the scapulæ (?).

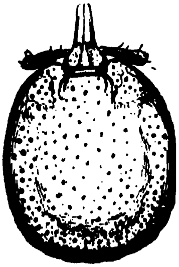
Measurements in mm.—Length of body 4, its greatest breadth 3·8; length of scutum 1·78, its greatest breadth 2·24.

Material.—A male and a female from *Varanus albigularis*, Deelfontein, Cape Colony, collected by Colonel Sloggett.

Amblyomma (*Aponomma*) *tenimberense*, sp. n.

♂.—*Scutum* longer than wide and roughly oval in shape, but slightly truncate posteriorly; its surface smooth and furnished with numerous punctures, which are superficial and unequal in size. Cervical grooves shallow, very short, and slightly curved. Marginal grooves are not present. Eyes absent (fig. 9).

Fig. 9.



Amblyomma (*Aponomma*) *tenimberense*, ♂. Dorsal view, × 10.

Ventral surface punctured and slightly wrinkled posteriorly.

Stigmata comma-shaped.

Rostrum long, the dorsal surface of the base furnished with a very slight median (longitudinal) keel. Hypostome furnished with three files of teeth on each side.

Legs.—Coxa of first leg armed with two spurs, the inner of them being smaller than the outer. Coxæ of the three posterior legs armed each with a single stout conical spur. Tarsus of fourth leg progressively attenuate and without any dorsal protuberance.

Colour of scutum dark brown. An iridescent greenish spot is present on the scapulæ, and a continuous marginal band of the same colour runs down either side, reaching the posterior end of the scutum. Additional traces of metallic green are present in the middle of the posterior margin (and it is possible that they are connected with the lateral bands in perfect specimens). Ventral surface a dirty yellowish-white.

Measurements in mm.—Length of scutum 2·75, its greatest breadth 2·4; length of rostrum 1·26.

Material.—A single example of the male sex from *Varanus indicus*, Timor-Laut.

Remarks.—This species is closely allied to *A. gervaisii*, Lucas, from which it chiefly differs in the shape of the tarsus of the fourth leg and in the shape of the scutum.

XXXVI.—*List of Mammals from Mount Kilimanjaro, obtained by Mr. Robin Kemp, and presented to the British Museum by Mr. C. D. Rudd.* By OLDFIELD THOMAS, F.R.S.

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BY the generous assistance of Mr. C. D. Rudd, whose zoological exploration of S. Africa is known to all mammalogists, a collector—Mr. Robin Kemp—has been employed for the past year in obtaining small mammals in British East Africa for the benefit of the National Museum. A considerable number of new species have been obtained, and these have been described on arrival in successive numbers of the 'Annals.'

Mr. Kemp has recently sent a collection from Mount Kilimanjaro, and it is thought that a complete list of them may in this case prove of utility to other workers on African mammals.

The collection was obtained at two localities—Taveta, alt. 2500′, at the foot of the mountain, on the British East African side; and Rombo, a mission station on the German side of the frontier, at an altitude on the mountain of about 6000′. Mr. Kemp was much indebted to the missionaries at Rombo for help and hospitality.

In nearly all cases the species obtained at the two places prove to be different, those from Rombo being Kilimanjaro mountain forms, while those from Taveta belong to the hot country and desert fauna which stretches northwards through Voi and Kitui to the region north-east of Mount Kenya.

1. *Rhinolophus deckeni*, Peters.

♂. 1157; ♀. 1153, 1154, 1155, 1156. Rombo.

2. *Rhinolophus fumigatus exsul*, K. And.

♀. 1072. Taveta.

3. *Rhinolophus lobatus*, Peters.

♂. 1048, 1049; ♀. 1022, 1046, 1047, 1050. Taveta.
♂. 1110. Marangu, 4000′.
♀. 1203. Rombo.

4. *Hipposiderus caffer*, Sund.

♂. 1056, 1058, 1059; ♀. 1054, 1055, 1057.

5. *Lavia frons*, Geoff.

♂. 1068; ♀. 1067, 1098. Taveta.

6. *Petalia thebaica*, Geoff.

♂. 1015, 1021, 1026, 1027, 1063; ♀. 1025. Taveta.

7. *Chærephon angolensis*, Pet.

♂. 1086. Taveta.

8. *Chærephon pumilus*, Cretzschm.

♂. 1089; ♀. 1082, 1083, 1084, 1085, 1087, 1089, 1090. Taveta.

9. *Erinaceus hindei*, Thos.

♂. 1111, 1112, 1120, 1132, 1139, 1141, 1150, 1158, 1160, 1165, 1179; ♀. 1121, 1134, 1138, 1140, 1143, 1148, 1149, 1159, 1173. Rombo.

Described from Kitui, British E. Africa. These specimens agree with the type in the markedly greater size of the skull as compared with the Soudanese *E. albiventris*.

10. *Petrodromus sultan*, Thos.

♂. 1020. Taveta.

11. *Elephantulus dundasi*, Dollm.

♂. 1036, 1041, 1076, 1077; ♀. 1016, 1061, 1066, 1078. Taveta.

I can find no difference between this series and the four examples in the Museum from Baringo, so that the species is evidently widely distributed through British East Africa. It is nearly allied to *E. pulcher* from Usambiro.

The species from the Athi plains which I described as *Macroscelides delamerei* proves to be a member of the restricted genus *Nasilio.*

12. *Crocidura monax*, sp. n.

♂. 1164, 1176, 1178, 1185, 1201; ♀. 1161, 1177, 1183. Rombo.

Size large, colour dark, tail nearly without bristles.

Size about as in *C. turba*, or rather larger. Fur thick, close and woolly; hairs on back 4·5–5·0 mm. in length. General colour dark slaty, very much as in *turba* and *fumosa*, scarcely lighter below. Ears, hands, feet, and tail uniform dark brown. Tail longer than usual, slender, practically without longer bristles, a few scattered ones present on the basal third—in this respect like *C. maurisca.*

Skull rather broader and flatter than in *C. turba.*

Dimensions of the type (measured in the flesh):—

Head and body 88 mm.; tail 66; hind foot 16·2; ear 10.

Skull: condylo-incisive length 24·3; basal length 20·8; greatest breadth 10·8; upper tooth-series 10·9; breadth between outer corners of m^2 7·2.

Type. Old female. B.M. no. 10. 7. 2. 58. Original number 1161. Collected 11th June, 1910.

The tail varies in length from 60 to 72 mm.

This species is at once distinguishable by its almost bristleless tail, the only other East-African shrew agreeing with it in this respect, *C. maurisca*, being very much smaller. *C. turba*, the most like it in other ways, has its tail unusually well covered with bristles. *C. fumosa* is smaller and also has a bristly tail. All other East-African species are wholly different either in colour or proportions.

13. *Crocidura* sp.

♂. 1028. Taveta.

14. *Crocidura* sp.

♂. 1033; ♀. 1024, 1034. Taveta.

I cannot determine these shrews satisfactorily at present. Perhaps the larger one may prove to be referable to *C. velutina*, Thos., though it is a little smaller and longer-tailed than the type, while the smaller species may be *C. gracilipes*, Peters. *C. hildegardeæ* is another member of the same group, but is smaller than either.

15. *Paraxerus aruscensis*, Pag.

♂. 1037, 1364; ♀. 1099, 1100. Taveta.
♂. 1174. Rombo.

Type locality in German E. Africa just south-west of Kilimanjaro.

16. *Otomys angoniensis elassodon*, Osg.

♂. 1113, 1123, 1152, 1166, 1167, 1175, 1187, 1193, 1194, 1202; ♀. 1114, 1117, 1126, 1137, 1144, 1146, 1147, 1162, 1163. Rombo.

These specimens may be provisionally referred to the East-African race described by Mr. Osgood under the above name.

17. *Otomys divinorum*, sp. n.

♀. 1151. Rombo, 5300′.

A member of the *irroratus* group, with broad nasals and seven laminæ in m^3.

Colour quite different from that of the previous species, the whole back being of a uniform dark cinnamon-brown instead of the coarsely lined and more buffy colour of the common form. Dark rings to the hairs scarcely apparent, brown, not black; light rings cinnamon. Basal four-fifths of the hairs of a rather paler shade of grey than in *angoniensis*. Tail shorter than in average specimens of that animal.

Skull with a markedly broader interorbital space than in other forms, the supraorbital beads almost obsolete for their anterior half, where they are so strong and well defined in *angoniensis*. Posteriorly they are well developed and strongly and angularly divergent over the front part of the brain-case, from which point they again evenly converge backward. In *angoniensis* they form an even oval outline, a postorbital angle being but rarely indicated. Nasals very broad anteriorly, the transition to the narrower part marked by a more distinct angle than in the previous species.

Dimensions of the type (measured in flesh):—

Head and body 173 mm.; tail 80; hind foot 26·3; ear 22.

Skull: greatest length 39; basilar length 31·7; zygomatic breadth 20·3; nasals 17·6 × 9; interorbital breadth 5·4; breadth between postorbital angles 13·1; height from supraorbital edge to alveolus behind m^2 12·8; palatal foramen 7·4; upper molar series (crowns) 8·4; breadth of m^1 2·2.

Type. Adult female. B.M. no. 10. 7. 2. 84. Original number 1151. Collected 10th June, 1910.

The series of *O. angoniensis* obtained by Mr. Kemp on Kilimanjaro is remarkably uniform, and as this specimen differs from all of them, both in colour and skull-characters, it should apparently receive a special name.

18. *Tatera nigricauda*, Peters.

♂. 1039, 1040, 1096; ♀. 1051, 1070. Taveta.

19. *Tatera mombasæ*, Wrought.

♂. 1035; ♀. 1018, 1029, 1091.

Very closely allied to *T. vicina*, Pet.

20. *Taterillus osgoodi*, Wrought.

♀. 1101. Taveta.

21. *Epimys rattus*, L.

♂. 1052; ♀. 1032. Taveta.

22. *Epimys* sp.

♂. 1030. Taveta.

23. *Epimys* sp.

♂. 1168, 1172, 1186; ♀. 1184, 1192. Rombo.

These two species are members of the *coucha-hildebrandti* group, but cannot be satisfactorily identified at present.

24. *Leggada triton murilla*, Thos.

♂. 1191, 1199, 1200. Rombo.

25. *Leggada tenella suahelica*, subsp. n.

♀. 1092. Taveta.

A darker form of the desert *L. tenella* of the Blue Nile.

Essential characters as in true *tenella*, including the presence of a darker median area running down head and back, white patches at bases of ears, general proportions, and the peculiar palate and zygoma-root. Body-colour, however, much duller and darker, the sides dull clay-colour and the dark dorsal area broader, especially above the shoulders. Face brighter buffy, almost as in *tenella*. Outer side of hind limbs dull greyish to ankles. Whole of under surface, hands, and feet pure white to the roots of the hairs. Ears blackish brown, the fine hairs on the metentote whitish. Tail dark brown above, whitish below.

Skull apparently as in true *tenella*, but owing to that of the type being imperfect in parts, this cannot be stated as to every detail.

Dimensions of the type (measured in flesh):—

Head and body 53 mm.; tail 33; hind foot 11; ear 10.

Skull: greatest length (c.) 16·6; palatal length 9·6; length of upper molar series 3.

Type. Young adult female. B.M. no. 10. 7. 2. 106. Original number 1092. Collected 24th May, 1910.

This belongs to quite a different type of *Leggada* from the ordinary E.-African *L. bella* and its allies, its elongated palate and other characters approximating it alone to *L. tenella*, of which it forms a local representative.

26. *Arvicanthis neumanni*, Matsch.

♂. 1044, 1095, 1102; ♀. 1042, 1043, 1093, 1094, 1103. Taveta.

Type locality Irangi, German E. Africa, about 150 miles S.W. of Taveta.

27. *Arvicanthis pumilio diminutus*, Thos.

♀. 1189. Rombo.

28. *Arvicanthis barbarus convictus*, Osg.

♀. 1060. Taveta.

Quite agreeing with a topotype from Voi obtained by Mr. Kemp on April 29th.

29. *Arvicanthis pulchellus ardens*, subsp. n.

♂. 1118, 1119, 1170, 1171, 1182, 1188, 1198; ♀. 1115, 1116, 1190. Rombo.

Similar in all essential characters to the ordinary E.-African striped rat (*A. p. massaicus*, Pag.; type locality Naivasha), but the colour warmer throughout. The whitish or cream-buff stripes and spots more strongly buffy and the ground-colour browner, not the distinct greyish of *massaicus*, in which also the fore-back is clearer grey than the posterior. Hind feet much more strongly buffy, ranging from clay-colour to ochraceous buff, while in *massaicus* they are buff or cream buff.

Other characters as in *massaicus*.

Dimensions of the type (measured in flesh):—

Head and body 119 mm.; tail 123; hind foot 27; ear 17.

Skull: greatest length 30·7; zygomatic breadth 14·6; length of upper tooth-row 5.

Hab. Rombo, Kilimanjaro, 5000–6000′.

Type. Adult male. B.M. no. 10. 7. 2. 119. Original number 1188. Collected 18th June, 1910, by R. Kemp. Presented by C. D. Rudd, Esq.

Striped rats of the present group from various localities in E. Africa, including Mt. Elgon, Mt. Ruwenzori, and Machakos, all agree closely with each other in their general greyish coloration and pale buffy feet, while the series from Rombo are on the average much more warmly coloured, with brown ground-colour, buffy stripes, and strongly buffy feet. As the former undoubtedly represent *massaicus*, which was described from Naivasha, the Kilimanjaro race needs a new subspecific name.

Just as the forms with continuous stripes may be looked upon as subspecies of *A. barbarus*, so those with interrupted and dotted lines may be considered subspecies of the W.-African *A. pulchellus*, Gray.

30. *Thamnomys surdaster*, Thos. & Wr.

♀. 1045. Taveta.

♂. 1133; ♀. 1181, 1195. Rombo.

These specimens agree in colour with the true Nyasa *surdaster* rather than with the more grey-headed E.-African form named by Mr. Osgood *T. s. polionops*.

The Taveta specimen differs from the Rombo set in certain details, but how far these are of importance can only be settled by the study of further material.

31. *Acomys wilsoni*, Thos.

♂. 1062, 1104; ♀. 1023, 1097, 1105. Taveta.

Also obtained at Voi in company with the newly described *A. ignitus*, Dollm.

32. *Tachyoryctes dæmon*, Thos.

♂. 1109. Maranga, Kilimanjaro, 4000′.

♂. 1125, 1127, 1135, 1136, 1169; ♀. 1122, 1124, 1128, 1129, 1130, 1131, 1142, 1145, 1180. Rombo.

So far as this series is concerned, the interesting point comes out that the eight females (excluding one wholly plumbeous) are all prominently and deeply black-headed, while the six males are without, or almost without, black on their heads. The variation in the colour of the head has been noticed before in *Tachyoryctes*, but its correlation with sex has not previously been observed. The females also average rather blacker on the back, and the one plumbeous individual is of the same sex.

33. *Heliophobius spalax*, sp. n.

♂. 1069, 1071, 1074, 1079; ♀. 1019, 1031, 1038, 1053, 1065, 1073, 1075, 1080, 1081, 1106, 1108. Taveta.

Allied to *H. emini*, but with a different structure of the palate.

Size, colour, and other external characters as in *H. emini*. No white frontal spot in any specimen.

Skull most readily distinguishable by the fact that the opening of the posterior nares is narrowed to a mere cleft, which penetrates to close behind the level of the molars, the whole mesopterygoid fossa being consequently much longer than in the allied species. The bone itself at and around the palation is thin, delicate, and perforated by foramina, very different to the strongly and firmly cemented closing in of the fossa in *emini* and the closely allied *kapiti*. In adult specimens representing *emini* and *kapiti* the mesopterygoid fossa measures 6·5 and 6·3 mm. respectively to the tip of the hamulars—in the present form about 8 mm.

Of other cranial characters, it may be noted that the nasals are more strongly broadened posteriorly, the broadest point being marked by a fairly sharply defined angle about 4 mm. from their posterior end. The postorbital processes are rather less salient. Sagittal crest more strongly developed.

Dimensions of the type (measured in flesh):—

Head and body 186 mm.; tail 14·5; hind foot 33.

Skull: condylo-basal length 45; greatest breadth 34·4; nasals 14·6 × 5·8; interorbital breadth 9·7; breadth across postorbital processes 12·1; mastoid breadth 22·2; palatilar length 24·2; diastema 15.

Type. Adult female. B.M. no. 10. 7. 2. 156. Original number 1081. Collected 20th May, 1910, by R. Kemp. Presented by C. D. Rudd, Esq.

The fact that this mole-rat is different from the *H. emini* of German E. Africa and *H. kapiti* of Central British East Africa comes as rather a surprise, for these two forms are so closely allied as to be most doubtfully separable from each other. But Taveta is almost exactly halfway between their respective localities, so that the occurrence of a special form there would seem to indicate that *kapiti* may possibly be really different from *emini*.

No light is thrown by the present series on the identification of the two forms collected by Speke—*H. albifrons* and *pallidus*, Gray,—both based on young specimens; the former with a large white frontal spot, and the latter of a peculiar pale and possibly albinistic colour. The structure of their palates is quite as in *emini* and *kapiti*, but their nasals, which are like each other, differ somewhat in form and extent from those of the more recently described species.

34. *Lepus crawshayi*, de Wint.

♀. 1017 (young), 1107. Taveta.

XXXVII.—*New Neotropical* Geometridæ.

By Louis B. Prout, F.E.S.

[Continued from p. 247.]

Cambogia bitæniata, sp. n.

♂. 28 mm.—Face and palpus yellow-brown; vertex and shaft of antenna snow-white; head, thorax, and abdomen dull yellow. Fore wing and hind wing pale lemon-yellow, with all the markings weak and shadowy; hind wing with a broad pearl-grey median and marginal band and a slight patch at base; fore wing with the marginal band only, the median only reaching M^2, the whole of the wing above being suffused with pearl-grey, except a yellow patch beyond cell before the marginal grey band; a distinct black cell-spot in fore wing, none in hind wing; fringes yellow. Underside altogether duller; the pearl-grey areas replaced by dull rosy, the median band in both wings nearly obsolete.

Pavas, West Colombia, 4400 feet, March 1908; one ♂.

Perhaps nearest to *C. marcescaria*, Guen.

Cambogia borratoides, sp. n.

♂. 26 mm.—Differs from *C. borrata*, Dogn. Ann. Soc. Ent. Belg. xxxvii. p. 84, in having the dark costal streak of fore wing narrower and no basal line on hind wing; marked, as in that species, by yellow spots on the costal edge and crossed by lustrous leaden lines, swollen and incurved in the dark costal part; the first line antemedian and straight, the second postmedian and slightly curved, the other two approximated to termen, the outer actually along termen above anal angle; an interrupted, reddish terminal line, not reaching below middle; fringe, except at apex, yellow. Hind wing with three curved leaden lines, one median and two outer; the terminal reddish line entire. Underside paler; the lines thicker and dull reddish; costal area of fore wing dull blackish suffused with reddish. Head and shoulders black-brown like costal streak; vertex narrowly white anteriorly; antennal shaft ringed black and white; thorax and abdomen yellow; legs yellow, the fore leg dark in front.

Cushi, Peru, 1820 m.; two ♂.

Larger than *borrata*, Dogn.

Cambogia inviolata, sp. n.

♂. 23–27 mm.—Face deep purple-brown; vertex and antennal shaft white; head, thorax, and abdomen yellow flecked with deeper; the abdomen banded with deeper yellow. Fore wing with apex prolonged and subacute, termen oblique and straight, as in *C. antiopata*, Warr. Nov. Zool. xi. p. 82, and *lilacina*, Warr. xi. p. 85, pale yellow suffused with darker yellow, and with darker yellow, sometimes faintly purplish-tinged, oblique wavy lines, but with no conspicuous purple bands or suffusion as in the species above-named; four lines before the cell-spot, which is minute but black and prominent, and seven beyond it; of the seven the innermost is strongest and the remaining six run in pairs, the last two being farthest apart; a wavy terminal line runs only to R^3; termen and fringe clearer yellow than the rest of the wing. Hind wing with basal half, especially towards costa, pale; with similar waved lines, in some cases confluent along the veins; no cell-spot. Underside paler, the suffusion more purplish and confined to the fore wing, the lines on fore wing indicated rather than marked.

Agualani, Carabaya, Peru, 9000 feet, December 1905 (wet season), three ♂ in Coll. L. B Prout; others seen.

Belongs, Mr. Warren tells me, to the group of *subtectata*, Walk., which I have not been able to compare.

Cambogia concatenata, sp. n.

♂. 20 mm.—Face and palpus purplish brown above, yellow below; vertex and occiput yellow, a narrow brown band between; shoulders brown; thorax and abdomen yellow, the latter ringed with brown. Fore wing lemon-yellow; the lines purplish brown; two pairs near base before the discal spot, both angled outwards on M and SM^2, the outer pair toothed on M^2, both interrupted below costa, which is more thickly marked with purplish; an outer band of three lines, the innermost of which is thick and blotched, but not dentate, the outer two lunulate-dentate, the teeth pointing basewards and connecting the lines, the three forming a blotch at costa with two yellow spots on its edge; submarginal line double, also lunulate-dentate, the inner one the thicker, with prominent teeth nearly reaching the postmedian band, also blotched on costa, the blotches connected laterally; an irregularly thickened, uninterrupted terminal line; fringe yellow, chequered with purple-brown at apex, middle, and anal angle, and less conspicuously beyond the other veins. Hind wing angled at R^3; three lines at base, followed by a yellow interspace as in fore wing; the innermost line of the outer three (which are here median) nearly straight and thick, the other two less concise, lunulate-dentate; submarginal lines broken up into series of lunules and striæ reaching the termen, the veins purple-dotted; terminal line much blotched at apex; fringe yellow. Underside like upper, but much paler.

El Congo, Colombia, June 1907; one ♂.

Very closely resembling *C. funiculata*, Warr. Nov. Zool. xi. p. 84, distinguished by its paler yellow ground-colour, and in the ♂ by the perfectly pectinated antenna, that of *funiculata* being rather long-ciliated. Apparently akin also to *C. reticulata*, Schaus, Tr. Am. Ent. Soc. xxvii. p. 265.

Orthonama vittistrigata (Staud., ined.), sp. n.

♂. 32 mm.—Head, thorax, and abdomen pale ochreous varied with brown. Fore wing pale ochreous, crossed by numerous oblique brown lines; basal patch edged by a thick brown line from one-fourth of costa to one-sixth of inner margin, and traversed by two fine lines; inner edge of central fascia formed also by a thick brown line, from before middle of costa to one-third of inner margin; the pale band preceding it traversed by three brown lines, of which the central one is the strongest; outer edge of fascia marked by a brown lunulate-dentate line, the teeth facing inwards; the fascia is traversed by several fine brown lines and contains a small dark cell-spot; the fascia is followed by a pale band traversed by a brown thread-like line marked with black dashes on the veins; terminal area slightly darker, traversed by three brown lines, of which the middle one forms lunulate spots in the intervals, and all three interrupted by a pale apical streak; terminal line dark, interrupted at the veins. Hind wing with the lines most distinct on the inner margin, except the outer line and terminal area, which are distinct throughout. Underside of fore wing blurred and of hind wing dusted with grey-brown; the cell spots and the three outer lines of the central fascia alone distinct.

Porto Alegre, Brazil; one ♂.

Belongs to the same section as *elongata*, Dogn. Ann. Soc. Ent. Belg. xlviii. p. 360, &c., the ♂ antenna minutely ciliated, nearly simple (*Cœnocalpe*, Warr., nec Hüb.). In the hind wing R^2 arises somewhat above the middle. Excepting the postmedian, all the lines of the fore wing are nearly straight; in most of the known species the antemedian is curved or angled beneath costa. The type specimen is not in good condition, but the course of the markings will render it very easy of recognition. My specimen is labelled (I think in the handwriting of Mabilde) *Phybalopteryx* (sic) *vittistrigata*, which seems to be a trade name of Staudinger's.

Orthonama roseimedia, sp. n.

♂. 26–28 mm.—Nearly related to *O. ignifera*, Warr. Nov. Zool. xii. p. 330 (*Cœnocalpe*), of the same shape and general aspect, but differing as follows:—Median area narrower and strongly suffused with rose-pink, which is slightly purple-tinged on the darker part of the wing; postmedian line strongly crenulate; the reddish costal shade narrower, extending scarcely beyond R^1, bounded by a diffuse blackish shade which joins the black subapical dash; the white spot in subterminal between R^3 and M^1 very small; hind wing more sharply marked, the postmedian line crenulate; underside more sharply marked, on fore wing with two conspicuous dark bars across the cell, which is otherwise rather bright red, and with the subterminal white spots larger than in *ignifera*, except that between R^3 and M^1, which is smaller.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); two ♂♂.

Orthonama vinosata, sp. n.

♂. 28 mm.—Head, thorax, and abdomen reddish fuscous; basal segments of abdomen dorsally brick-red. Fore wing lavender-grey, the bands limiting the central fascia and an elongate-triangular costal patch before apex chestnut-brown; the basal patch more reddish, and followed by a narrow band of still brighter brick-red; the pale bands on each side of central fascia very narrow, with a slender dark line down each; outer edge of fascia protuberant on R^1 and R^3, indented on M^2 and SM^2; subterminal line undefined except on the subapical patch, but followed between R^3 and M^1 by a wedge-shaped dark mark, with its pointed end outwards; a fine dark terminal line interrupted at the veins; fringe grey, the basal half darker than the apical; a dark cell-spot. Hind wing with waved inner, three waved median, and three submarginal lines darker grey, mostly blurred except at inner margin, the submarginal ones especially so. Underside pale grey, the inner-marginal half of fore wing blurred dark grey; both wings suffused, especially in costal half, with vinous; the lines fuscous; cell-spots black.

Limbani, Carabaya, Peru, 9500 feet, May 1904 (*G. Ockenden*); one ♂.

Reminds of a large and brightly-coloured *O. corteza* (Dogn.) *, with which it agrees in shape and structure, but distinguished, *inter alia*, by the subapical patch of fore wing, the otherwise pale outer area, with distinct dark wedge-spot, and by the much more uniformly coloured hind wing, that of *corteza* being white except at inner margin and termen.

Euphyia albimedia, sp. n.

♂. 35 mm.—Face reddish ochreous, mixed with white and fuscous, a small frontal tuft; palpus similarly coloured, quite moderate, strongly rough-scaled; antenna lamellate, minutely ciliated; collar whitish; thorax as face; abdomen slightly paler. Legs pale ochreous, without special modifications; fore leg dark anteriorly. Fore wing ample, costa arched, apex rather acute, termen moderately oblique. Wings smooth-scaled; pale sandy ochreous, much mixed with white, except between postmedian and subterminal, and slightly dusted with fuscous, more strongly at costa from base to antemedian; a fuscous mark close to base, followed by an ochreous shade; three reddish-brown bars or narrow bands, more or less margined with fuscous; the first subbasal, weakly angled in cell; the second antemedian, from before one-third costa to two-fifths inner margin, irregular, projecting two teeth distad above M and below M^2, somewhat incurved on submedian fold and outbent at SM^2; the third postmedian, broader, its outer edge (the true "postmedian line") from two-thirds costa to about four-fifths termen, somewhat oblique outwards to M^1, with slight projections before and behind R^3 and M^1, incurved to M^2, then nearly direct to inner margin, slightly outcurved on either side of SM^2; median space from SC to inner margin white, faintly dusted and containing a very small blackish cell-mark; postmedian followed by a very slender white line; subterminal line pale, lunulate-dentate, not very distinct; terminal line dark fuscous, much interrupted, forming irregular pairs of spots, separated by ochreous vein-ends. Hind wing not very broad, apex very slightly produced, termen faintly waved; pale sandy ochreous, somewhat greyer from base to postmedian; postmedian as in fore wing, but much more indistinct, almost merging into the ground-colour proximally; terminal line as in fore wing. Underside without the ochreous colour, the markings somewhat blurred, greyish fuscous; fore wing with basal area suffused as far as antemedian; postmedian followed by a white band, to which succeeds a fuscous submarginal band in anterior half of wing, becoming a mere line in posterior half; hind wing similar, but with no basal suffusion; a small but distinct discal dot, which is not observable on upperside.

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* *Thibalapteryx corteza*, Dogn. Ann. Soc. Ent. Belg. xl. p. 146= *Cœnocalpe nitida*, Warr. Nov. Zool. xii. p. 330 (nov. syn.).

Alfalfar, Chili, December 1888 (*V. Izquierdo*); one ♂.

The exact relationship of this species is unascertained, but it certainly belongs in a general sense to *Euphyia* (type, *picata*, Hüb.). The antennal ciliation is even shorter than in the type species, the palpus perhaps slightly shorter, but most points of structure agree perfectly.

WARRENIA, gen. nov.

(*Brachymeria*, Warr. MS., nec Westw. 1842.)

Face rounded, apparently without tuft *. Palpus very short, porrect. Antenna in ♂ lamellate, with fine pubescence, nearly simple. Fore wing with cell less than one-half (in the type species scarcely two-fifths), areole double, both ample, SC^5 from well before apex of areole. Hind wing with cell short (about one-third), discocellulars straight and oblique, R^2 from centre.

Type of the genus: *Warrenia sphyrophora*, sp. n.

An offshoot of *Anapalta*, distinguished by the shorter cells and palpus. It was proposed by Mr. Warren, *in litt.*, as *Brachymeria* (nom. præocc.) for *flavilucens*, Warr. Nov. Zool. xii. p. 327 (*Anapalta*), but as I have drawn up the characterization from *sphyrophora*, it is necessary to declare that the type. The genus is well worth adopting, though its characteristics are less extremely pronounced in *costimaculata*, Warr. Nov. Zool. xiv. p. 223, and *immixta*, Dogn. Ann. Soc. Ent. Belg. liii. p. 228, which should evidently be referred to it, and there will possibly be found troublesome connecting-links.

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* Unfortunately the face-scales seem very liable to abrasion, though I have studied specimens otherwise perfect.

Warrenia sphyrophora, sp. n.

♂. 34 mm.—Face brownish fuscous above, pale ochreous below; palpus ochreous; head and thorax varied fuscous and ochreous; abdomen fuscous, pale-ringed between the segments. Fore wing pale ochreous, much suffused with brownish fuscous, which is darkest in the costal area; basal patch edged by a fine nearly straight pale line, and the inner edge of central fascia by another less straight (inbent on SM^2), the interval between them with a black mark in cell; outer edge of central fascia from one-half costa, deeply lunulate-dentate below middle; cell-spot large and round, deep black, beneath it the proximal half of fascia, except close to proximal edge, is clear pale ochreous; band beyond fascia pale ochreous, with a slightly marked waved intersecting line to middle of wing, below which it is obscured by the fuscous terminal suffusion; it is followed on costa by a large triangular dark blotch, edged outwardly by the pale subterminal line, which is joined by a pale streak from apex, and marked below middle by dark wedge-shaped marks tipped with paler; the pale apical streak is preceded by a small dark triangular costal blotch and has a more diffused dark blotch on termen below it; fringe fuscous, with a pale spot at apex. Hind wing dark fuscous, whitish ochreous to the postmedian line; postmedian line curved, pale ochreous; cell-spot large and dark. Underside of fore wing dark fuscous, with the band beyond central fascia yellowish from costa to middle, and an ochreous patch in cell before the large dark cell-spot; a large white apical spot: of hind wing yellowish, with a curved postmedian band and broad terminal border dark fuscous; cell-spot large and dark, oval, connected with base by a dark streak; termen narrowly whitish from apex to R^1; fringe of both wings brown, at the apex pale ochreous.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂.

Very close to *W. flavilucens*, Warr., from Peru, but differing in the increase of the dark coloration, which leaves the ochreous band much narrower (this is particularly noticeable on the underside, where the colours are more sharply defined), the conspicuous white apical marks beneath, the equally conspicuous mallet-shaped mark at base of hind wing beneath, larger cell-spots, and more strongly bent postmedian band of hind wing. Warren's type was a ♀, but this differentiation holds also on comparison with a ♂ in Coll. Brit. Mus.

SMILEUMA, gen. nov.

Face rounded-prominent, apparently not tufted (more or less abraded in all available specimens). Palpus short (*plagifracta*) or rather short (*salediza*), quite moderately rough-scaled. Antenna in ♂ lamellate, nearly simple. Hind tibia with all spurs. Abdomen not crested. Fore wing triangular, apex moderately acute, termen strongly oblique, as long as inner margin; cell less than one-half, discocellulars incurved, oblique below, SC^2 arising out of SC^1, anastomosing with SC^{3-4} beyond SC^5 (further beyond in *plagifracta*) to form a broad simple areole; R^1 connate with SC^{3-5}; M^1 separate from R^3. Hind wing with termen not very strongly convex, apex therefore slightly but roundly produced; cell short, little over one-third, discocellulars not biangulate, oblique below, SC^2 rather long-stalked, with R^1, R^2 from middle of DC, M^1 separate from R^3. Scaling very glossy.

Type of the genus: *Smileuma salediza*, Dogn. Ann. Soc. Ent. Belg. xxxvii. p. 575 (*Cidaria*).

Nearly related to the preceding genus, distinguished by the simple areole. On Meyrick's tabulations it would fall into the Palæarctic *Plemyria* as used by that author (=*Plemyria* + *Epirrhoë* + *Eulype* + *Trichodezia*) and stated by him to be numerous in South America. It has most in common with *Plemyria*, sens. str. (type, *bicolorata*, Hufn.), and *Epirrhoë* (type, *alternata*, Müll.,=*sociata*, Bork.), but they both have the cell of fore wing normal (one-half), the palpus stronger, the shape of wings and several details of venation different; while some characters which are not usually regarded as generic—the smooth glossy scaling and the different type of pattern—probably point to a wider evolutionary divergence.

Smileuma plagifracta, sp. n.

♂. 30–32 mm.—Head, thorax, and abdomen brown-black, the abdomen somewhat paler, with pale segmental rings dorsally; occiput and collar light brown. Fore wing light brown with the markings glossy brown-black, namely: a basal patch, a triangular central fascia, a large irregularly rounded costal blotch before apex and a small patch at apex, also a band, interrupted at M and SM^2, between the basal patch and central fascia and four irregular submarginal marks in the interspaces between R^3 and M^2 and from M^3 to inner margin; all the dark markings finely edged with pale yellowish; a fine fuscous-brown terminal line edged as finely with yellow; fringe brown. Hind wing glossy brown-grey, with a postmedian pale, dark-edged line projecting strongly below middle, the terminal area beyond it dark smoky grey with weak traces of a pale lunulate-dentate subterminal line. Underside glossy fuscous, the præapical costal blotch of fore wing brown-black, preceded by an oblique pale yellow streak to middle of wing, and finely pale-edged externally; hind wing with the outer line whitish, and a whitish mark at tornus.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); two ♂♂.

This species bears some superficial resemblance to "*Cidaria*" *bogotata*, Walk. List Lep. Ins. xxv. p. 1395, but is quite distinct structurally, that species having a double areole, and biangulate discocellulars in the hind wing.

Hammaptera sciera, sp. n.

♂. 32 mm.—Antenna scarcely ciliated. Head and thorax olive-green (somewhat discoloured). Abdomen grey, ventrally paler and more ochreous, dorsally with paired series of blackish marks, more or less confluent into short transverse bands. Fore wing green, tinged with olive, the markings brownish fuscous, namely: an ill-defined band close to base, marked with a distinct black spot on inner margin; some indistinct dark shading midway between this band and the median, but not reaching to inner margin; antemedian line (forming proximal edge of median band) from one-third of costa to one-third of inner margin, subdentate, starting vertically from costa, then curved and somewhat oblique basewards; postmedian (distal edge of median band) dark fuscous, from just before two-thirds costa to just beyond two-thirds inner margin, lunulate-dentate and forming a double projection between R^3 and M^2; a median band containing some less distinct lines, and dark-shaded, leaving the centre, except on submedian fold, of the green ground-colour; cell-spot elongate; marginal area somewhat darker green, with pale lunulate-dentate subterminal, which is filled in proximally with fuscous shading between the radials and between M^1 and inner margin; three dark dashes from costa, one on either side of the subterminal and one at the proximal edge of the marginal darker green area; terminal line composed of heavy black spots on either side of the veins, connected with black spots in the fuscous-grey fringe. Hind wing fuscous, somewhat lighter towards costa, terminal line less distinct than in fore wing, fringe paler grey. Underside very pale ochreous with the markings fuscous; fore wing with the beginning of a band from costa at one-fifth, a dark cell-spot, a postmedian band thickened and angled below R^3, thence oblique inwards, but only reaching to M^2, an apical cloud reaching to R^3, containing a few pale spots near apex, the largest at the apex itself, further but less distinct clouding below M^1; hind wing beneath with distinct cell-spot and narrow marginal band, which is a good deal interrupted, especially from R^3 to M^1, no other markings, excepting two or three indistinct vein-dots indicating the postmedian.

Pozuzo, E. Peru, October 1906 (wet season); one ♂.

Nearly related to *H. heteroptila*, Warr. Nov. Zool. viii. p. 463, from Brazil, for which it has doubtless been passed over; larger, fore wing appearing somewhat more elongate, brighter green, not mixed with reddish, central area narrower, its inner edge more concave, its outer projecting less between R^3 and M^1, hind wing uniform dark grey. I am very doubtful as to the propriety of retaining this and the two following species—together with the large group to which they belong—in *Hammaptera*. Mr. Warren seems also to have hesitated, having published some of them as *Epirrhoë* (in err. pro *Euphyia*) and some in *Anapalta*, but pending further revision I leave them in what he now considers the best position.

Hammaptera luxuriata, sp. n.

♂. 32–34 mm.—Exceedingly like the most deeply and richly coloured forms of *H. trajectata* *, but differing in the following points, some at least of which will prove constant: palpus slightly shorter, scarcely reaching beyond frontal tuft; metathoracic crest apparently more deeply bipartite; central fascia typically with more of the vinous and less of the black scales, not appreciably constricted in middle of wing, its proximal margin wanting the deep sinus of *trajectata*; the white line which follows the postmedian not projecting a long tooth into central fascia on SC^5; hind wing greyish-clouded in cell and from inner margin to M^1 (in the darkest aberrations of *trajectata* the grey shading is uniform across the wing, leaving a postmedian band and subterminal line white); under surface, especially of hind wing, darker, the postmedian pale band from costa of fore wing broader and whiter, postmedian line of hind wing nearer to termen (fully 3 mm. distant in *trajectata*, only 2 mm. in *luxuriata*, at least at the nearest point—below R^3).

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* *Larentia trajectata*, Walk. List Lep. Ins. xxiv. p. 1188, = *Cidaria grumata*, Feld. Reise Novara, Lep. Het. tab. cxxxiii. f. 6 (nov. syn.) = *Cidaria sabrosa*, Dogn. Ann. Soc. Ent. Belg. xxxvii. p. 577 (nov. syn.); this is sunk in the British Museum Collection as *pipiata*, Guen., but I cannot reconcile Guenée's description.

Torné, Colombia, August 1907; four ♂♂.

Two of the examples are in most beautiful condition, and the difference of tone and aspect from *trajectata*—of which I also possess very fine material from Ecuador, Peru, and Bolivia—provoked careful investigation, with the results given above. Had one only a single example, it might possibly be passed over as an aberration of the very variable *trajectata*.

Hammaptera albipennis, sp. n.

♂. 34 mm.—Very much resembling *H. trajectata*, but somewhat paler; the outer edge of central fascia more deeply indented beyond cell, and more sharply oblique to submedian fold; the pale band beyond it white with a grey thread, not tinged with green, and broader below middle; hind wing with the termen, especially at apex, more rounded, white, with a line of confluent grey spots close before termen; a slight grey cloud at base; underside of fore wing with apex white, the pale band beyond the central fascia brown; underside of hind wing dark close before termen.

Huancabamba, N.E Peru; three ♂♂.

Walker's "*Cidaria*" *extensata*, from Bogotà, seems to be also near to this species. His type is not in very good condition, but it shows no trace of the characteristic dark border to the hind wing.

Perizoma (?) *renitens*, sp. n.

♂. 36 mm.—Head and thorax dark fuscous; abdomen grey, with pairs of large black spots on hinder edge of dorsal segments. Fore wing with basal patch blackish brown with a grey middle band; interval between it and central fascia pearly grey with a bluish-white tinge, its centre dull tawny, wider at costa, its outer white edge broad, projecting into central fascia between SC and M^2, and traversed by a dark grey lunulate-dentate line; central fascia margined with brown bands, the brown becoming velvety black above SC and below SM^2, the centre blue-grey; cell-spot black, ringed with paler bluish grey; beyond cell the outer brown band is marked with a black patch; band beyond fascia blue-grey, white at costa, traversed by an inwardly dentate dark line; terminal area a mixture of blue-grey, brown, and fuscous, with a bright brown quadrate subapical patch, and traversed by two or three inwardly dentate dark lines, the veins dotted black and pale; subterminal line ill-defined, followed by black wedge-shaped marks on the interspaces, those below R^3 and M^2 with a white spot at base; pale dots at the vein-ends and black lunules between them; fringe fuscous, proximal half darker than distal. Hind wing fuscous grey with a bluish tinge; a dark lunulate-dentate postmedian line, followed by a grey band before the darker terminal area; terminal line and fringe as in fore wing. Underside glossy grey-brown with line and cell-spots darker.

Huancabamba, Cerro del Pasco, E. Peru; one ♂.

I know of no species with which to compare this. The palpus is longer than in typical *Perizoma*, as it occurs in Europe, and the larger size of the insect, very glossy scaling and slightly crenulate termen of hind wing cause it to suggest in aspect a *Triphosa* almost as much as a *Perizoma*. Yet the latter genus is at present allowed to contain species with even longer palpus than *renitens*—*conjunctiva*, Warr., *haasi*, Staud. (*Cidaria*), *basiplaga*, Schaus (*Psaliodes*), &c.—and the last-named is of very nearly the texture of the new species. The antenna of *renitens* is nearly simple, the face with a slight tuft, palpus rough-scaled, DC of hind wing biangulate, the lower arm moderately produced.

Perizoma (?) *apiceflava*, sp. n.

♂. 27 mm.—Head and thorax concolorous with fore wing, shoulders marked with dull yellow; abdomen concolorous with hind wing; legs blackish, the tarsal joints yellow; tongue yellow. Fore wing dull blackish; edge of basal patch nearly vertical, faintly curved outwards; inner edge of central fascia bent on SC, then vertical, with a slight projection on M; the band between yellow, filled with confluent fuscous striations, except along the margins, which show as fine yellowish lines; outer edge of central fascia bluntly rounded in middle, oblique outwards from costa and inwards to inner margin, obscure except from costa to R^1, where it is followed by a yellowish buff band, traversed by black middle line, and connected above R^1 with a triangular oblique yellow apical patch, preceded by a blackish, externally lunulate-edged costal triangle; marginal line black, interrupted by yellow spots at the vein-ends;

fringe blackish, yellow at extreme apex; cell-spot black. Hind wing somewhat produced at apex, almost pointed; blackish grey, with cloudy dark cell-spot, very obscure pale curved outer line, and yellow dots on termen, that at apex running out into the grey fringe. Underside dull blackish, with the yellow markings restricted, the hind wing powdered with grey and showing two dark lines, the outer one marked with whitish on veins; the terminal yellow dots distinct.

Huancabamba, Cerro del Pasco, E. Peru; one ♂.

Recalls in shape a *Psaliodes*, but the palpus is only moderately long, scarcely longer than that in the preceding species, with which this seems to agree pretty well in structure; face tufted, palpus strongly rough-scaled above and below; antennal cilia slightly more apparent than in *renitens*, but still minute.

Psaliodes bicolor, sp. n.

♀. 20 mm.—Head and palpus pale flesh-colour, the latter externally redder; thorax and dorsum dark grey; venter and sides pale grey; legs fleshy ochreous, dotted with darker. Fore wing pale fleshy ochreous dusted with grey in basal third, dull brick-red dusted also with grey in distal two-thirds; the dividing-line oblique and slightly waved, pale ochreous, preceded by another similar line; median fascia darker red, especially towards its bounding-lines, the outer, parallel to the inner, being somewhat lunulate-dentate, but indistinct; incurved below costa and followed by a fine dark line, also incurved; terminal area narrowly darker; fringe rather narrow, whitish chequered with grey; cell-spot black. Hind wing whitish, with slight grey dusting and faint flush of reddish; a dark cell-dot and faintly marked lunulate-dentate postmedian line; a dark smear at anal angle. Underside of both wings like upperside of fore wing, dull brick-red, with some ochreous patches on costa before apex, beyond postmedian and subterminal lines; cell-spots dark, that in hind wing ringed with pale, followed by a pale zigzag outer line.

San Antonio, W. Colombia, 5800 feet, November 1907 (*M. G. Palmer*); one ♀.

Nearest to *Ps. vulpina*, Warr. Nov. Zool. xi. p. 523, from Peru, which has the whole fore wing brick-red, with inner outer lines pale, and the hind wing altogether darker. A ♂ in coll. Dognin, somewhat worn, from the same locality, is slightly paler.

Lasiophanes nigranalis, sp. n.

♂. 26 mm.—Differs from *L. rufisticta*, Warr. Nov. Zool. xii. p. 333, in being paler grey, no black streaks between the veins below costa before subterminal line, nor red streaks on the veins; hind wing pale luteous grey, with only an anal tuft of shining black hairs, the fringe shining iron-grey; underside of both wings pale grey, the fore wing with no rough scales; the hind wing with all the lines and shades dark grey and well developed; abdomen with dark dorsum, a black belt on basal segments and black ring before anus, the tip of which is shining black.

Huancabamba, N.E. Peru, 5000-6000 feet, January 1906; one ♂.

Spargania diversimedia, sp. n.

♂. 36 mm.—Face white, shaded with ochreous in middle; palpus black, white at end of each joint; vertex of head bright ochreous; fore femur black above, ochreous whitish below, fore and middle tibia and tarsus banded black and ochreous whitish; thorax bright ochreous anteriorly, variegated in middle, metathoracic tufts ochreous; abdomen marked as in *cultata*, Guen. Fore wing white, the area beyond basal line strongly clouded with fuscous from less than one-fourth costa to one-half inner margin, very obliquely and irregularly bounded distally; base with the scales very varied, the effect being of dull olive dusted with bright ochreous, almost golden; subbasal line thick, black, sharply angled in cell, followed by a white line before the dark clouding; antemedian line black, starting very obliquely from a large triangular costal spot at about two-fifths, crossing the cell-spot (which is large and black, slightly larger even than in *cultata*), then very sharply bent basewards, and losing itself in the dark cloud; postmedian blackish, in one specimen less distinct, lunulate-dentate and somewhat zigzag, commencing from a costal black mark near to that of the antemedian, oblique outwards to below R^3, thence approximately parallel to termen; a submarginal line from an oblique black streak at two-thirds costa, its course nearly as in *cultata*, but the lunules between R^3 and M^2 stronger; the area distally to this line dark clouded, except between R^1 and M^2, the apical clouding olive to the subterminal, darker from thence to termen, streaked and dusted with bright ochreous, almost golden scales; the tornal clouding fuscous; subterminal white, dentate, only distinct from costa to R^1, where it is distally edged with black, and towards tornus; terminal line formed as in the allied species; fringe white, less pure in apical half, strongly chequered with fuscous; in addition to the above markings there are some faint lunulate grey lines in the white areas, as in the rest of the genus. Hind wing grey, with traces of darker dentate shading for postmedian, and in one specimen with a dark grey cell-spot; terminal line and fringe as in the allies. Underside pale grey, the markings as in *cultata,* but somewhat weaker.

Huancabamba, N.E. Peru, 5000–6400 feet; two ♂♂.

Probably a near relative of *S. cultata,* to which it is very similar in markings, though its larger size and absence of definite green colouring make it rather recall *lichenea,* Ob. Et. Ent. vi. tab. iii. fig. 6 (*Cidaria*). It is certainly not a local race of *cultata,* of which I have a perfectly typical example from Huancabamba. *Spargania schistacea,* Warr. Nov. Zool. xi. p. 77, is also related, but much darker.

Spargania ruptifascia, sp. n.

♂. 40–42 mm.—Extremely similar to *Spargania lichenea,* Ob. (=*cenizata,* Dogn. Le Nat. 1893, p. 28, nov. syn.), differing as follows: slightly larger; face somewhat more ochreous (in *lichenea* it is nearly white), the palpus more minutely tipped with white; fore wing with the dark line from two-sevenths costa much less angled in cell, but on the other hand with a strong indentation on submedian fold which is wanting in *lichenea,* median fascia still less clearly defined than in that species, forming a small dark patch at costa and another from inner margin to submedian fold, in the middle of the wing scarcely indicated except by the zigzag lines which bound it, the white band beyond the postmedian rather clearer, broad, the olive shade which follows it broader than in *lichenea,* reaching to the subterminal, the costal dark markings in distal area stronger, subterminal not strongly toothed basewards on SM^2; hind wing more varied, the inner-marginal area being broadly shaded with grey, the costal and apical area whiter, cell-spot distinct; underside of hind wing with stronger cell-spot and better developed postmedian line.

Huancabamba, N.E. Peru; two ♂♂.

The above comparison has been made with four ♂♂ of *lichenea* from the same locality, and there seems no room to doubt that the differences are specific, not varietal. In this form of *lichenea* the hind wing is white; but I have a specimen before me from W. Colombia in which, as in Oberthür's figure, it is uniformly greyish, while it has more of the dark markings, thus in part forming a transition between the two Huancabamba species; emphasis therefore should be laid not on the depth of colouring, but on the palpus and the course of the lines on the fore wing.

Spargania indentata, sp. n.

♂. 44 mm.—Shoulders, tegulæ, and metathoracic tuft olive-green; head, thorax, and abdomen ochreous (? faded from green); abdomen marked with blackish laterally and before the segmental incisions of dorsum; venter and legs greenish ochreous; anal tufts fulvous beneath. Fore wing olive-green, the dark shadings greenish black, edged finely with white; basal patch small with crenulate edge, much darker before the white line; median fascia with wavy inner edge indented along M, then vertical; outer edge oblique outwards, with an indentation on R³ and a strong bidentate projection between R³ and M², then wavy to inner margin parallel to termen; costal portion of fascia greener than the rest; space between basal patch and the fascia unusually broad, its centre occupied by a broad curved olive-green belt with still darker centre; subterminal line white, interrupted, forming dark, white-tipped lunular spots between veins, that in submedian interval double and larger, without white tip, traversing at costa a deeper olive-green patch which becomes blackish on each side of the line, and followed beyond cell by a double black lunule; terminal black dashes between the veins, thicker in upper half of wing; fringe pale and dark green. Hind wing orange-red, along abdominal margin greenish fuscous, its edge diffuse and curved from upper end of cell to M², below which it runs straight to termen; dark terminal dashes between the veins; fringe fuscous. Underside pale green at base, merging into dull fulvous beyond middle; outer lines darker followed by a pale interval; apex of fore wing and terminal area of hind wing speckled with dark; extreme apex of fore wing pale green; in both wings the cell-spots black.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂.

Belongs to the group of *flavolimbaria*, Mssn., Stübel's Reise, tab. ix. f. 6 (genus *Eriopygidia*, Warr.); apparently nearest to *selika*, Th.-Mieg, Le Nat. 1895, p. 181 (*Cidaria*).

Eucymatoge hilaris, sp. n.

♂. 21 mm.—Face varied black and whitish ochreous; palpus black, whitish-tipped; thorax and venter pale ochreous, speckled and marked with black in places; legs pale ochreous, broadly black banded exteriorly; abdomen dorsally bright ferruginous, with some black markings anteriorly. Antennal cilia nearly as long as diameter of shaft. Fore wing shining pale ochreous, the costa whiter and with five black blotches, the first four increasing in size distally, marking the origin of the lines, which below SC are rust-coloured marked with a few black scales, thicker and brighter at inner margin, those forming median fascia much outcurved above middle; cell-spot large and black; subterminal line whitish, dentate, not distinct except on the subapical costal blotch; a præsubterminal shade interruptedly black marked, most strongly on the folds; fringe pale ochreous, chequered with blackish in basal half. Hind wing whitish, with abdominal margin ochreous; cell-spot black; the lines faint, except along abdominal margin, where they are strongly marked with black; termen ochreous grey beyond an indistinct lunulate-dentate subterminal line. Underside of fore wing blurred grey; costa marked with black; cell-spot black; underside of hind wing ochreous with the lines blackish, cell-spot black.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂.

Eucymatoge sobria, sp. n.

♂ ♀. 24 mm.—Like *E. costirufaria*, Warr. Nov. Zool. xiv. p. 247, but lighter, silvery grey, with the red-brown shading nearly obsolete, only appearing quite weakly in basal area and cell, along costa, and *narrowly* before subterminal line; cell-spot smaller; postmedian line somewhat less thick, more broken into dashes on the veins; subterminal line preceded and sometimes followed by strong black dashes between the veins, which are very weak or wanting in *costirufaria*; a larger, darker subtornal blotch than in that species. Hind wing less reddish grey than in *costirufaria*, the abdominal margin not reddish, the markings on it black, except the subtornal blotch, which is fuscous brown, not red-brown. Underside dark grey, not brown-grey *.

Agualani, Carabaya, Peru, 9000 feet, December 1905 (wet season); one ♂ (type), two ♀ ♀.

Mr. Warren suggested to me that this was a form of "*Tephroclystia*" *analiscripta*, Warr. Nov. Zool. xiv. p. 248, but this seems to me absolutely impossible. Even if *analiscripta* be really a *Eucymatoge* (I unfortunately omitted to examine the venation when comparing), *sobria* is larger, with more elongate wings, sharper markings, the postmedian line of fore wing more angled (in *analiscripta* rather *curved*—"bluntly bent" according to Warren). My only hesitation is whether it be a paler, greyer form of *costirufaria*, with which it agrees in structure, unless perhaps the fore wing be slightly more pointed; in both, the wings are distinctly elongate, the termen of the fore wing long.

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* Warren, not being engaged on a comparison between two allies, not unnaturally says of *costirufaria* "underside dark grey," but the difference of tone is very marked indeed.

[To be continued.]

BIBLIOGRAPHICAL NOTICE.

The Biology of Birds.

A History of Birds. By W. P. PYCRAFT, Zoological Department, British Museum. With an Introduction by Sir RAY LANKESTER, K.C.B., F.R.S. Pp. xxx+458. With 38 Plates and numerous Figures. Methuen & Co., London, 1910. Price 10*s.* 6*d.*

AMONG the many books on birds this new one by Mr. Pycraft occupies a distinctive place. It is, we believe, quite by itself—a *Biology* of birds, permeated through and through with the Evolution-idea. For just as the theologian sees everything *sub specie æternitatis*, so the post-Darwinian biologist sees everything *sub specie evolutionis*. So many zoological books have encouraged our hopes in their prefaces by declaring their intention to give prominence to habits and history, and have soon dashed them to the ground by adopting a thoroughly statical mode of treatment, that we almost expected that Mr. Pycraft would likewise fall victim to his specialisms, and give us a beautiful treatise on comparative osteology with the bird as a natural climax. We hope that he will do this by and by, for he has a rare osteological insight; but we are glad that he has kept true to his biological programme, and worked it out with so much success. There was need for a book of this kind, and we have now *à posteriori* as well as *à priori* reasons for knowing that Mr. Pycraft was the man to write it.

Let us first indicate the scope and arrangement of the book. The introductory chapter discusses the structure and internal functions of birds, the second their pedigree, the third their classification, or, rather, the lines of their evolution. Then follow chapters on geographical distribution, the seasonal punctuation of the bird's life, and migration. Inter-relations between birds and other organisms, between birds of different kinds, and between the members of a bird-community form the subject of a natural group of three chapters. The author then passes to the relations of the sexes, the nest, the eggs, the care of the young, the adaptations of nestlings—another fine series. A chapter on development and life-history, considered in their broad œcological aspects, leads on to variations, modifications, natural selection, sexual selection, and isolation—a series that makes in itself a vivid introduction to the study of evolution. Having discussed the raw materials of evolution and the directive factors, Mr. Pycraft returns to the results achieved—the adaptations, both static and dynamic, that are so conspicuous in a highly evolved class such as birds. The volume concludes with a chapter on convergence or homoplasy in evolution—one of the puzzles, probably illuminating puzzles, of ætiology—which deserves far more serious study than it has hitherto received. We believe that a careful analysis of the phenomena of convergence would throw much light into many dark corners. We are glad that the author has adopted and firmly adhered to a logical, as well as naturally biological, order of treatment, for even when the reader is not hyperæsthetic in regard to such matters there is an undoubted subconscious effect which gives a peculiar virtue to a well-planned book.

In addition to its mode of treatment, the book has many outstanding features. Throughout the chapters we find illustrations of the author's intimate knowledge of birds as entire organisms. Mr. Pycraft is certainly one of the "Knowers" to whom Sir Ray Lankester refers in his interesting introduction. Another feature is the fresh independence of many of the author's positions. We have grave doubts about some of them, *e. g.* the interpretation of the colour of desert-birds (p. 84); but there is no doubt that the author advances many that are novel and very suggestive, and none that he has not made his own. Another feature, hard to define, is a robust wholesomeness of outlook, which may be illustrated by remarks (p. 305) on what was done with "*Athene chiaradiæ.* another outstanding feature in the book is the old-fashioned ralist's love that the author has for birds both big and li striking feature when one remembers that Mr. Pycraft is an e osteologist to whom a valley of dry bones is positively delecta since he can make them live and tell stories. There is something about birds that softens even the hardest morphological heart.

The book is beautifully illustrated by a series of plates by G. E. Lodge and others, and we wish to emphasize this in regard to them, that they are not only works of art (the photographs, too, of course), but of high scientific interest. We feel that they are there for an intellectual purpose—to illustrate a scientific point—which they effectively serve. As in the case of the simple illustrations scattered throughout the text, they have had brains put into them. The book is pleasant to handle, and the publishers are to be congratulated on this first volume of "Animal Life: an Evolutionary Natural History." The people we are sorry for are those who have to write the other volumes, for they have a model set them which will require some working up to!

We venture to turn for a little to successive chapters, to illustrate by a few samples the freshness and independence of Mr. Pycraft's work. Thus in the introductory chapter we find a criticism (which demands amplification on the author's part and consideration by other ornithologists) of the use of the preen gland, usually regarded as furnishing an unguent for the feathers. That there are many difficulties in this orthodox interpretation is certain, and Mr. Pycraft makes the suggestion that it may have served or may still serve as a scent-gland. We venture to offer another—that it may be of use as a stimulus to the flow of salivary juice! The second chapter contains an original restoration of *Archæopteryx* and a speculation as to the evolution of a wing from a parachute. In the third chapter we have an evolutionary sketch of the orders of birds, which could only come after prolonged attending of the mind thereunto, and the pedigrees suggested are made, to our thinking, very much more valuable by the insertion of a genealogical tree. This useful device cannot do harm when an author is so careful to insist upon uncertainties as Mr. Pycraft always is.

From the distributional chapter, which is almost too condensed, we may select the note that the Penguins seem to be the only group of importance with a southern origin, and the protagonists of the north will also be pleased to find Mr. Pycraft's adherence to the view that Trogons, Parrots, and Struthious birds are northern forms which have spread southwards. The chapter on migration does not seem to us so strong as the others; thus the movements of Swallows in particular are taken to illustrate the conclusion that the normal migration is due north and south, and an attempt is made to correlate a wide migratory range with prolific reproductivity on the one hand, and catholicity of appetite on the other. As one would expect, the chapter on inter-relations is fascinating, and we may refer to an instance given to show that the Cuckoo keeps careful watch on birds likely to prove suitable victims. "A young Cuckoo was found in the nest of a Pied Wagtail which had built in a flower-pot containing a plant trained over an intricate trellis-work, leaving but small interspaces just big enough to allow the passage of so small a bird, and this flower-pot, it is to be noted, was placed in a greenhouse. Thus, then, the Cuckoo must have watched the Wagtails collecting nesting materials, and have watched their destination. Then, having deposited its egg on the ground somewhere in the vicinity, it must have picked it up and gone straight to the flower-pot, thrust in its head, and dropped the egg into the nest." But is Mr. Pycraft pulling the reader's leg when he says of the commensalism of Petrels and *Hatteria* that the Petrel seems generally to live on the left, the "lizard" on the right side of the burrow?

The mode of treatment followed by the author in the section of the book that deals with family affairs seems to us peculiarly happy and successful. The chapters abound in significant facts, which are utilized with good judgment. Song is not necessarily correlated with happiness: "the most famous singer of all, for example, the Nightingale, will sing when alarmed, or under the emotion of a great shock, as when its nest and eggs are destroyed, or when roused from sleep by some sudden alarm." The theory that imitation plays an important part in the construction of the nest is dismissed, though it is rather the absence of evidence in favour of the theory than anything against it that is urged. The whiteness of some eggs is primitive, and in other cases secondarily derived; and a very interesting state of affairs is illustrated by the British Puffin, whose eggs are found to be thinly covered over with a layer of white over a coloured surface. It is suggested that birds that nest in holes have white eggs, not because they took to holes to hide their conspicuous eggs, but because "in such dimly lighted places coloured eggs, from their low refractive power, would run grave risks of being broken whenever the bird entered the nest, while white eggs, in this dim religious light, are just visible."

One of the many interesting suggestions in the chapter on the care of offspring concerns the bright colours which are sometimes seen around and in the mouth of nestlings; these are interpreted as guides to the parents when feeding their young; but this is only one of the many fresh pieces of biological interpretation in this section of the book—where, indeed, to our thinking, the high-water mark is reached. In the last of the chapters in this section the author deals with the periods of life and their expression in the plumage, and ends up with death, in regard to which we are glad to have from a naturalist with so wide an experience of birds a confirmation of an important generalization. He says "death from senescence is probably rare indeed." By a momentary lapse of artistic sense, or for some reason the true inwardness of which is too subtle for our perception, the author passes beyond the full stop of death to offer a few notes on play, which suggest, moreover, an insufficient appreciation of the work of Groos.

There are so many points of interest in the section dealing with variation and heredity, selection and isolation, that we are embarrassed in our attempt to select what is most distinctive. We may refer, however, to what is said of discontinuous variation; to the suggestion (that recalls Weismann) of variations going on increasing in a given direction if selection does not stop them; to the cautiously expressed idea of the environment supplying variational stimuli—an idea which will perhaps bulk largely in the future of ætiology; to the rejection of the view that modifications may be transmissible; to the interesting paradox that the displaying of plumage is a habit very much more ancient than having gorgeous plumage to display. It is characteristic of the book throughout that it opens many doors of inquiry and closes next to none; it does not "finish" subjects, but suggests what must be done to develop them. Thus it is natural that it should end by bringing the reader back to the *facts* of adaptation which are before us as riddles still imperfectly read; and one of the remarkable facts about adaptation is that with which the book closes, that the same kind of result may be reached along different paths by animals which are not nearly related to one another.

In his illustration of the chief concepts of the evolution theory Mr. Pycraft calls attention to the mass of material that has passed through the hands of ornithologists without being fully utilized, and to the numerous opportunities for crucial observations and experiments that have been lost. But this was inevitable with the rapidly widening Darwinian outlook, and it serves little purpose to reproach the past. Mr. Pycraft has done much better than that, for he has produced a book which will be an inspiration to many an ornithologist with the root of the matter in him who has been working along rather narrow lines. He has given us one of the most interesting and educative books that we have read for many a day, and he has our hearty thanks and congratulations.

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 34. OCTOBER 1910.

XXXVIII.—*New African Phlebotomic Diptera in the British Museum (Natural History).*—Part VII. Tabanidæ (*continued*). By Ernest E. Austen *.

(Published by permission of the Trustees of the British Museum.)

Pangoniinæ.

Dorcalœmus †, gen. nov.

Agreeing with Pangonia, *Latr.* (sensû stricto), *except that in the wings the fourth as well as the first posterior cell is closed before reaching the margin, and that the wings themselves, instead of tapering to the distal extremity, are more bluntly rounded at the tips, thus having a characteristic shape, which, by comparison with that seen in,* e. g., Pangonia rostrata, *Linn., is relatively short and broad. Ocelli wanting. Face in both sexes without a shining callus on each side.*

Typical species, *Pangonia compacta*, Austen (Ann. & Mag. Nat. Hist. ser. 8, vol. i. p. 212 (1908); 'Illustrations of African Blood-sucking Flies,' p. 61, pl. iv. fig. 28 (1909):—Southern Rhodesia and Nyasaland Protectorate).

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* See Ann. & Mag. Nat. Hist. ser. 8, vol. iii. p. 280 (1909).

† *Dorcalœmus*=a plague to antelopes (δορκάς, an antelope; λοιμός, a plague or pest).

Up to the present time the species belonging to this new genus, which is sufficiently characterized in the foregoing diagnosis, have been met with only in South Central Africa. In addition to the typical species, *Pangonia compacta centralis*, Austen (Ann. & Mag. Nat. Hist. *loc. cit.* p. 214:—Nyasaland Protectorate), and *P. fodiens*, Austen (*ibid.* p. 215:—Nyasaland Protectorate), also belong to *Dorcalæmus*.

From the South-American genus *Scione*, Walk., in which the fourth posterior cell is likewise closed, *Dorcalæmus* is distinguished by its species having bare eyes and a very different *facies*.

Dorcalæmus bicolor, sp. n.

♂.—Length (1 specimen) 13·5 mm.; width of head 4·25 mm.; distance from upper margin of occiput to anterior extremity of face 3·25 mm.; length of proboscis 5·2 mm.; greatest width of abdomen (base of second segment) 5 mm.; length of wing 9 6 mm.; greatest width of wing 3·6 mm.

A slenderly built species, with (at least in the ♂) relatively narrow tapering abdomen.—Face short, but little prominent, yellowish-white pollinose, lower part of sides clove-brown; thorax olive, yellowish pollinose; first three segments of abdomen buff on dorsum, cream-coloured below, remainder of abdomen clove-brown, on dorsal surface an area on first segment immediately beneath scutellum and a median basal spot on second segment also clove-brown; wings with a light sepia tinge; femora, except extreme tips, clove-brown or black, tibiæ, tarsi, and extreme tips of femora cream-buff, last two joints of all tarsi and tips of remaining tarsal joints brown or brownish.*

Head: upper part of sides of face and basi-occipital region clothed with pale yellowish hair; *palpi* clove-brown, terminal joint curved and very slender; *proboscis* black; first and second joints of *antennæ* clothed with black hairs, first joint blackish, grey pollinose, second joint buff, third joint ochraceous-rufous, somewhat brownish at tip. *Thorax*: dorsum, including scutellum, clothed with bright Naples-yellow hair, mixed with dark brown hair, especially on anterior portion of dorsum and on hind margin of scutellum; pollinose covering on sides of dorsum lighter than that on disc of dorsum; pleuræ clothed with pale yellowish hair, a tuft of black hair immediately in front of and below base of wing.

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* For names and illustrations of colours, see Ridgway, 'A Nomenclature of Colors for Naturalists' (Boston: Little, Brown, & Company, 1886).

Abdomen: dorsum clothed with black hair, second and third segments each with a band of pale, shining, whitish-yellow hair on hind border; ventral surface of second and third segments clothed with shining whitish-yellow hair and with a patch of black hair in each anterior angle; venter clothed elsewhere with black hair. *Wings*: stigma ochre-yellow, veins ochraceous, fourth and sixth and distal extremities of other longitudinal veins brown. *Squamæ* buff. *Halteres* cream-buff, stalks ochraceous-buff. *Legs*: femora, tarsi, anterior surfaces of front and hind tibiæ and of distal extremities of middle tibiæ clothed with black hair, legs elsewhere clothed with pale yellowish hair.

Nyasaland Protectorate: Zomba District, 1909 (*Dr. S. K. Norris*).

So far, at any rate, as may be judged from the male, *Dorcalæmus bicolor*, owing to its coloration and narrow and elongate body, is readily distinguishable from any other species of its genus at present described.

Genus PANGONIA, Macq.

Pangonia bubsequa, sp. n.

♀.—Length (2 specimens) 16 to 17·2 mm.; width of head 5·2 to 5·8 mm.; width of front at vertex just under 1 mm.; distance from upper margin of occiput to anterior extremity of face 4·4 to 4·6 mm.; length of proboscis 7·2 to 9 mm.; length of wing 14 to 16·4 mm.; greatest width of wing 5 to 5·6 mm.

Allied to Pangonia oldii, *Austen, from which it may be distinguished by the tawny-ochraceous area on the dorsum of the abdomen being confined to the first* (i. e. *first visible*) *segment, which contrasts sharply with the following segments in colour, and by the absence of a* (*more or less complete*) *transverse band of silvery-white hair on the hind borders of the second and fourth abdominal segments.—Thorax olive-brown, dorsum when viewed at a low angle from behind appearing dull saffron-yellow pollinose; first* (*visible*) *segment of abdomen tawny-ochraceous, second segment dark mummy-brown, third to sixth segments inclusive clove-brown, sixth and seventh segments yellowish pollinose and clothed with Naples-yellow hair, lateral margins of fourth and fifth segments and hind border of fifth segment* (*more or less completely*) *clothed with yellowish hair; wings brownish, extreme base and costal cells mummy-brown; femora dark brown at base, then chestnut or* *cinnamon-rufous, front and middle tibiæ buff, front and middle tarsi ochraceous-buff, hind tibiæ and tarsi chestnut.*

Head buff pollinose, lower part of sides of face mummy-brown; shining black callus on each side of face oblong, widely separated from front margin of buccal cavity; ocellar spot shining dark brown, more or less quadrate, not reaching eye on each side; a dark patch in centre of front, connected below with an elongate reddish-brown callus between and above bases of antennæ; jowls and basi-occipital region clothed with yellowish-white hair; *palpi* and *antennæ* cinnamon-rufous, first and second joints of antennæ greyish pollinose, first joint clothed with yellowish, second joint for most part with long blackish hairs. *Thorax*: dorsum viewed vertically from above showing traces of three narrow, raw-sienna-coloured, longitudinal stripes on median third; dorsum, including scutellum, clothed with short, erect, Naples-yellow hair, which immediately in front of prescutellar groove is mixed with blackish hair in middle line; longer hair on each side, on upper margin of mesopleura, above base of wing, and on postalar callus yellowish white; pleuræ clothed with yellowish hair; a small tuft of black hair beneath base of wing on each side. *Abdomen* very convex above; first (first visible) segment blackish beneath scutellum, elsewhere clothed with ochraceous hair, with some pale straw-yellow hairs on each side of middle line in front of hind margin; second segment in case of type lighter in middle than at sides, with a few yellow hairs on each posterior angle, visible only from the side; hind border of fifth segment and that of fourth except on each side dull, more or less yellowish pollinose; second to fifth segments inclusive clothed, except where already stated to the contrary, with short black hair; some black hairs also among the yellow hairs on sixth segment; venter clothed for most part with short black hair, fifth and following segments clothed with yellowish hair. *Squamæ* buff. *Halteres*: stalk brownish, knob ochraceous-buff. *Legs*: front coxæ clothed on anterior surface with yellowish-white hair; femora, hind tibiæ, and upper surface of hind tarsi clothed with black hair; front and middle tibiæ and upper surface of front and middle tarsi clothed with Naples-yellow or ochraceous hair; tarsi clothed beneath with bright ochraceous-rufous hair.

Nyasaland Protectorate and North-Eastern Rhodesia: type from Kapemba Valley, Luviri River, Akamanga, North Nyasa, 4. v. 1909, "biting cattle" (*Dr. J. B. Davey*); a second specimen (in possession of the Hope Department, Oxford University Museum) is from the Loangwa Valley, N.-E. Rhodesia, 12–20 miles west of Petauke, 1700 ft., 8. iv. 1905 (*S. A. Neave*).

Pangonia concitans, sp. n.

♀.—Length (2 specimens) 10·4 to 11·5 mm.; width of head 3·6 to 3·8 mm.; width of front at vertex 0·6 mm.; distance from upper margin of occiput to anterior extremity of face 2·8 to 3 mm.; length of proboscis 4 mm.; length of wing 10 to 11·25 mm.; greatest width of wing 4 mm.

Allied to and in appearance somewhat resembling Pangonia rüppellii, *Jaenn.—Thorax olive, dorsum dull saffron-yellow pollinose, clothed with ochre-yellow hair; abdomen ochraceous, fourth, fifth, and sixth segments each with a clove-brown transverse band on dorsum, third segment with a dark brown spot or blotch in middle line, second and following segments each with a buff-yellow pollinose band, clothed with appressed chrome-yellow hair, on hind border; wings light mummy-brown; femora, except extreme tips, dark brown (seal-brown to clove-brown), tarsi, tibiæ, and extreme tips of femora ochraceous-buff.*

Head yellowish pollinose; face short, only moderately prominent; a shining, seal-brown, roughly quadrate spot on each side of face, next eye; a transverse somewhat rhomboid callus below antennæ, and an elongate callus on upper half of front, not extending to upper margin of occiput, shining black; jowls and basi-occipital region clothed with yellowish-white hair; *palpi* cinnamon-rufous or chestnut; *proboscis* clove-brown, relatively stout; *antennæ* ochraceous-rufous, first and second joints yellowish pollinose, clothed with yellowish hair, third joint fairly broad at base. *Thorax*: pleuræ clothed with straw-yellow hair. *Abdomen*: dorsum of first (first visible) segment clove-brown beneath scutellum; clove-brown transverse bands clothed with black hair, remainder of dorsum clothed with chrome-yellow hair, which on third segment is mixed with minute black hairs; clove-brown bands on fifth and sixth segments rounded off or tapering on each side, band on sixth segment not reaching lateral margins; seventh segment also with a dark brown transverse band in front (largely concealed beneath hind margin of preceding segment), not extending to lateral margins, but somewhat deeper on each side of middle line; distal extremity of venter banded similarly to dorsum; ventral surface of segment which is the first visible on dorsal side and that of next two segments cream-buff or buff, clothed with similarly coloured appressed hairs; clove-brown transverse band on ventral plate of following segment obsolete in one specimen except on each side; ventral plate of seventh segment clove-brown except hind border and lateral margins. *Wings* somewhat paler towards hind margin, stigma ochraceous, veins tawny. *Squamæ* buff. *Halteres* cream-buff, stalks brownish or ochraceous-buff. *Legs*: coxæ dusky, grey pollinose, clothed with straw-yellow hair; femora clothed with black hairs, mixed, at least in case of middle and hind femora, with some yellow hairs; tibiæ and tarsi clothed with buff-yellow hair.

Northern Nigeria; type and one other specimen from South Bornu, September, 1907 (*Dr. H. A. Foy*). The donor's field-note is as follows:—"Attacking horse; sucked blood on the wing without settling, and darted away after feeding."

Pangonia concitans may be distinguished from *P. rüppellii*, Jaenn., which also occurs in Northern Nigeria, *inter alia* by the face being shorter, by the proboscis (including the labella) being shorter and thicker, by the pale bands on the hind borders of the distal abdominal segments being buff-yellow and clothed with chrome-yellow hair, instead of whitish and clothed with similarly coloured or yellowish-white hair, and by the absence of a posterior median notch in the dark band on the fourth abdominal segment.

Genus Cadicera, Macq.

Cadicera nigricolor, sp. n.

♀.—Length (1 specimen) 15 mm.; width of head 5 mm.; width of front at vertex 0·75 mm.; length of proboscis 3·75 mm.; greatest width of abdomen (third segment) 8 mm.; length of wing 14·8 mm.; greatest width of wing 5·5 mm.

Body entirely black, clothed with black hair, and totally devoid of lighter markings; wings dark brown, with a purplish tinge; legs varying in colour from clove-brown or almost black to dark chestnut-brown, and clothed with black hair except on inside of front tibiæ, where a longitudinal streak extending from base almost to distal extremity is composed of minute, appressed, buff-yellow hairs.

Head: front clove-brown, face dark Vandyke-brown, thinly clothed on each side with dark brown hairs, traces of grey pollen on antennal protuberance and on sides of face next eyes; basi-occipital region clothed with black hair; *palpi* dark Vandyke-brown, proximal joint clothed below with long, fine, blackish hair, terminal joint elongate, 2·25 mm.

in length in case of type, thickened just beyond middle, but less swollen than in certain other species of *Cadicera*, clothed with black hair; *proboscis* clove-brown; first and second joints of *antennæ* clove-brown, clothed with black hair (third joint missing in case of type). *Thorax*: dorsum shining, pleuræ and pectus dull. *Abdomen* purplish black, somewhat less shining than dorsum of thorax owing to surface being more coarsely punctured at base of each hair, and also scored with fine transverse striæ. *Wings*: costal cells darker than remainder of surface, anal and axillary cells paler, remaining cells each with a more or less pronounced paler central area or streak; veins clove-brown. *Squamæ* and *halteres* clove-brown. *Legs*: front legs and middle tibiæ and tarsi dark chestnut-brown.

Southern Rhodesia: Chirinda Forest, Melsetter District, 3800 ft., 1. x. 1909 (*C. F. M. Swynnerton*).

From all species of *Cadicera* already described except *C. crassipalpis*, Macq., *C. nigricolor* is at once distinguished by its uniform black colour, which is unrelieved by lighter markings of any kind. The less elongate and relatively broader abdomen, and the coloration of the antennæ, wings, tibiæ, and tarsi differentiate the new species from *C. crassipalpis*.

Genus Chrysops, Meigen.

Chrysops laticeps, sp. n.

♀.—Length (1 specimen) 8 mm.; width of head 3·2 mm.; width of front at vertex 1·6 mm.; length of wing 8 mm.

A stoutly built thickset species, with broad head and sharply defined, narrow, oblique, transverse band on wings.—Head cream-buff pollinose, smoke-grey on vertex; antennæ relatively short; thorax yellowish-grey pollinose, dorsum in front with two narrow, admedian, buff-coloured longitudinal stripes, widely separated and not or scarcely extending beyond transverse suture; abdomen ochraceous-buff at base, dorsum of second to seventh segments inclusive each with a clove-brown transverse band, hind borders of these segments yellowish grey or yellowish pollinose, last three segments and hind borders of third and fourth segments thickly clothed above with ochre-yellow hair; legs, except middle and hind coxæ and tips of tarsi, cinnamon, hind tibiæ fringed on outer side with ochre-yellow hair.

Head: *frontal callus* shining black, transversely elliptical, but not extending to eyes; *ocelli* widely separated, each ocellus situate upon a small shining black spot; these spots are separate from each other, and the foremost spot is not connected with the frontal callus; face broad and relatively flat, not tumid or prominent; *facial tubercles* in the shape of a vertically elongate, rectangular, shining clove-brown spot below each antenna; *eyes* large, descending to lower margin of head, no shining spot on jowls; face, jowls, and upper half of front clothed with fairly long, pale yellowish hair; *palpi* ochraceous-buff, proximal joint clothed below with long buff-yellow hair, terminal joint moderately large, its proximal portion fairly broad, and its outer surface clothed with short, appressed, buff-yellow hairs, and dark brown in centre; *antennæ* 2·5 mm. long, first two joints of approximately equal length and each about three-fourths as long as third joint, first and second joints cylindrical and of equal thickness, clothed with short black hair, first joint not incrassate, second and third joints dark brown, second joint paler (cinnamon) on inner side, first joint cinnamon, brownish at tip on upper side. *Thorax*: dorsum on each side with a broad yellowish pollinose stripe extending from humeral to post-alar callus; dorsum (including scutellum) clothed with erect pale straw-yellow hair; pleuræ yellowish pollinose, clothed with straw-yellow hair. *Abdomen*: ochraceous-buff area at base of dorsum extending to distal angles of second segment; first segment with a clove-brown, median, quadrate blotch, extending beyond scutellum, but not reaching hind margin of segment; clove-brown transverse band on second segment in contact with front margin in centre, but curving away from front margin on each side and diminishing in depth, somewhat emarginate posteriorly in middle line, separated from hind margin of segment by a space equal to about one-fourth of the length of latter, and not or only indistinctly reaching lateral margins of segment; clove-brown bands on five following segments each in contact with anterior margin throughout their extent, separated from hind margin by roughly one-third of length of segment in each case, tapering somewhat towards each side, and not quite reaching actual lateral margins of segments; bands on second to fourth segments inclusive clothed, except on sides, with short dark brown hair; sides of first segment clothed with straw-yellow hair, those of second and third segments clothed with short, appressed, buff-yellow hair; hair on extreme lateral margins longer, forming a fringe; venter ochraceous-buff, clothed with appressed buff-coloured hair, second segment with an ill-defined, dark, transverse band in middle, not reaching sides, anterior borders of following segments infuscated. *Wings*: extreme base, costal border above and as far as end of first longitudinal vein, stigma, and transverse band mummy-brown; transverse band extending obliquely backwards from first longitudinal to posterior branch of fifth vein, base of its proximal margin on a level with base of third longitudinal vein, that of its distal margin on a level with distal extremity of stigma, band narrowing until it reaches base of fifth posterior cell, in which, as also in discal cell, it is somewhat emarginate on its outer side; veins mummy-brown, in places ochraceous-buff. *Halteres*: knob dark brown, stalk cinnamon. *Legs*: middle and hind femora clothed with maize-yellow hair, long and fine below; front tibiæ stout, but not incrassate, distal two-thirds brownish; last four joints and distal extremity of first joint of each tarsus dark brown.

Zululand: Kosi Bay, February–March, 1906 (*F. Toppin*: presented by Mr. E. Warren, Government Museum, Pietermaritzburg, Natal).

With *Chrysops fuscipennis*, Ricardo (Mashonaland and Nyasaland Protectorate), *C. ciliaris*, Lw. (the type of which was stated by its author to be from "Caffraria"), and the new species from Northern Nigeria described below, *C. laticeps* forms a well-defined group, recognizable at once by the sharply defined and characteristic wing-markings (which are without an apical blotch on the distal portion of the costa), as well as by the general *facies*, including the broad head, broad and thickset body, and fringed hind tibiæ. From *C. ciliaris*, Lw., *C. laticeps* may be distinguished *inter alia* by the abdominal markings, the bands on the third and following segments being entire instead of widely interrupted in the middle line; from *C. fuscipennis*, Ricardo, the new species is distinguishable by its shorter antennæ, differently shaped ocellar spots, and conspicuous bands of ochre-yellow hair on the dorsum of the abdomen. Owing to its small size and dusky coloration, especially its dark abdomen and legs, the following species cannot possibly be confused with *C. laticeps*.

Chrysops pusillula, sp. n.

♀.—Length (1 specimen) 5 mm.; width of head 2 mm.; width of front at vertex 1·2 mm.; length of wing 5·2 mm.

A very small dusky species, with sharply defined wing-markings of the same type as those of C. laticeps *(no apical blotch on costa).—Head smoke-grey, pollinose, front mouse-grey; thorax mouse grey, pollinose, except median third of dorsum, which is light grey; dorsum of thorax in case of type with a pair of elevated and widely separated shining black* *longitudinal stripes, interrupted on transverse suture; abdomen clove-brown, clothed above with relatively long and mainly dark brown hair, hind borders of first and second segments light grey; legs entirely clove-brown, front tibiæ slender, not at all incrassate, hind tibiæ stouter, bearing on outer side a fringe of long and fine dark brown hair, inner surface of hind tibiæ with a shorter and less conspicuous fringe.*

Head: front broad, *frontal callus* large, shining black, semicircular in outline (lower margin straight), not extending to eyes; *ocelli* close together, anterior ocellus in contact with upper margin of callus, a transversely elongate shining black fleck extending outwards from each of the other ocelli, but not reaching eye; face slightly arched, but not prominent, an irregularly quadrate, shining black *facial tubercle* below each antenna, each tubercle (in typical specimen, at any rate) in contact with its fellow in middle line above; *eyes* large, descending to lower margin of head, no shining spot on jowls; upper half of front and middle part of face clothed with brownish hair, jowls clothed with yellowish hair, hair on face and jowls long and erect; *palpi* dark brown, terminal joint curved, not swollen at base; *antennæ* short, dark brown, first and second joints cylindrical, clothed with brownish hair (third joint missing in case of type), first joint not swollen, but thicker and somewhat longer than second, combined length of first two joints in case of type 1 mm. *Thorax*: pleuræ clothed with brownish hair; scutellum clove-brown. *Abdomen*: grey hind border of second segment narrow, of uniform depth, occupying about distal seventh of segment; grey hind border of first segment deeper on sides than in middle (at least twice as deep as hind border of second segment); extreme hind margins of third to sixth segments inclusive narrowly lighter (yellowish pollinose); a small patch of yellowish hair in middle of hind borders of first and second segments; terminal segment clothed with yellowish hair above and below; venter dark brown, clothed (except terminal segment) with brownish hair. *Wings* hyaline, extreme base, costal border above and as far as end of first longitudinal vein, and a sharply defined, oblique, transverse band, resting on distal third of first longitudinal vein and extending into anal cell, just beyond posterior branch of fifth vein, dark brown; transverse band crossing wing in such a way as to leave approximately distal third of discal cell hyaline; proximal and distal margins of transverse band roughly straight, without a projection or conspicuous indentation; centre of discal cell somewhat lighter; veins brown. *Halteres*: knob russet-brown, stalk dark brown. *Legs*: femora clothed beneath with long and fine brownish hair.

Northern Nigeria: S. Bornu, between September and December, 1908 (*Dr. H. A. Foy*).

As stated above, at the end of the description of the foregoing species, *Chrysops pusillula* belongs to the well-marked group which also includes *C. ciliaris*, Lw., *C. fuscipennis*, Ricardo, and *C. laticeps*, Austen, from all of which it can readily be distinguished by its small size and by its dark-coloured abdomen not being lighter at the base.

Chrysops inflaticornis, sp. n.

♀.—Length (3 specimens) 8 to 9·5 mm.; width of head 2·75 to 3 mm.; width of front at vertex 1·2 mm.; length of wing 8 to 8·75 mm.

Dorsum of thorax marked alternately with greyish olive-brown and smoke-grey longitudinal stripes; abdomen ochraceous-buff, dorsum of second and following segments each with a more or less indistinct russet-brown transverse band, second to fifth segments inclusive each with hind margin and a median triangle on hind border pale; first and second joints of antennæ shining tawny ochraceous, first joint strongly swollen, elliptical-oval; wings with costal border and sharply defined, oblique, transverse band, tapering towards hind border, mummy-brown, apical blotch on costa present and below it a fainter infuscation, including tip of wing and extending along hind border as far as axillary cell and anal angle, meeting transverse band in fourth or fifth posterior cell; legs ochraceous, none of the tibiæ incrassate, hind tibiæ with a fringe of short hair on outer side.

Head broad, cream-coloured pollinose, upper half of front yellowish pollinose; front broad, *frontal callus* either clove-brown, raw-sienna-coloured in centre above, or raw-sienna-coloured, clove-brown on lower margin and towards each lateral extremity; *frontal callus* fairly prominent, in shape a wide and low triangle, with apex directed upwards and blunt, and the lateral angles rounded off and either in contact with or only narrowly separated from the eyes; *ocelli* somewhat widely separate, each ocellus surrounded by a small dark brown spot, the spot encircling each upper ocellus sometimes taking the shape of a narrow triangular streak, extending outwards towards eye; face broad, somewhat arched and prominent, *facial tubercles wanting*, no shining spot on jowls; front, face, jowls, and lower surface of head clothed with erect yellowish hair, longest below; *palpi* clothed with similar hair, proximal joint dark grey, terminal joint cream-buff, bluntly lanceolate in outline, not curved; first and second joints of *antennæ* clothed with short blackish hair, first joint with a dark brown longitudinal streak on outer side of distal half, second joint dark brown at extreme tip (third joint missing in specimens available for examination). *Thorax*: dorsum marked with three greyish olive-brown and four smoke-grey longitudinal stripes, and also with a small, elongate, dark grey streak on each side above base of wing; pleuræ light grey, clothed with whitish hair; dorsum, including scutellum, clothed with short yellowish hair; *scutellum* cinnamon-rufous, its base marked with a transversely elongate greyish olive-brown spot, not extending to sides. *Abdomen*: dorsum of first segment with a clove-brown median area beneath scutellum, not or scarcely reaching hind margin; dorsum of second segment with a small, rounded, greyish olive-brown or blackish spot in middle line near front margin; darker bands on dorsum extending to sides in case of third and fourth segments, band on fifth segment sometimes reaching sides, bands on second and last two segments not extending to sides; bands on third and following segments in each case in contact with front margin throughout their extent, band on second segment in contact with front margin in middle line, but curving away from it towards each side; paler areas on dorsum, including posterior angles and hind margin of first segment, anterior angles of second segment, hind borders of second to sixth segments inclusive, and posterior median triangles on second to fifth segments inclusive clothed with minute, glistening, appressed, yellowish hairs; darker areas of dorsum clothed with minute, appressed, blackish hairs; *venter* buff, clothed with minute, appressed, yellowish hairs, second segment sometimes with a small, dark, median spot, similar to that on dorsum of same segment. *Wings*: mummy-brown costal border deeper towards base of wing, and including, besides base of wing itself, proximal extremities of first and second basal cells; *stigma* when seen against a light background cinnamon or tawny-ochraceous; proximal margin of transverse band commencing on a level with base of third longitudinal vein, approximately straight, distal margin of transverse band commencing halfway between distal extremity of stigma and proximal end of apical blotch, notched, sending out a projection to base of fork of third longitudinal vein, and also indented below distal extremity of discal cell; transverse band terminating in distal extremity of anal cell; costal border indented in marginal cell by upper extremity of a milky streak, which borders distal margin of transverse band as far as fourth posterior cell, separating apical blotch and infuscation below it from transverse band. *Halteres* dark brown, knobs paler below. *Legs*: coxæ clothed with whitish hair, middle and hind coxæ grey, front coxæ buff, grey at the tip; trochanters, tips of femora and of first joint of each tarsus, and last four joints of each tarsus except at extreme base dark brown, front tibiæ brownish at distal extremity; femora clothed with pale yellowish or whitish hair, tibiæ clothed with short blackish hair, hind tibiæ also with short yellowish hair on outer side at base.

Cape Colony: type and two other specimens from Annshaw, King William's Town District (*Miss Barrett*).

The coloration of the antennæ and their swollen first joints, in conjunction with the sharply defined wing-markings, will suffice to distinguish this species from any other African *Chrysops* at present known.

Genus RHINOMYZA, Wied.

Rhinomyza perpulcra, sp. n.

♀.—Length (6 specimens) 12·25 to 12·6 mm.; width of head 4 to 4·2 mm.; width of front at vertex 0·5 to 0·6 mm.; length of wing 11·8 to 12 mm.

Dorsum of thorax mummy-brown, unicolorous; dorsum of abdomen tawny-ochraceous, with two broad, black, longitudinal stripes, either entire or more or less incomplete after reaching hind margin of third segment; pleuræ, pectus, and venter buff, without markings; both upper and lower branches of third joint of antennæ long and slender; wings with a yellowish tinge, especially in proximal half; costal border, including distal extremity down to level of posterior branch of third longitudinal vein, first basal and proximal two-thirds of second basal cell, and a broad transverse band, starting from costal border below stigma, extending to posterior margin, and curving back into tips of anal and axillary cells, clove-brown.

Head orange-buff, front immediately above base of antennæ and prominent central portion of face darker (tawny or tawny ochraceous), the latter more or less shining; elongate, shining *frontal callus* shaped as in *Rh. denticornis*, Wied., tawny, with upper half dark brown, or at least with a dark brown spot above middle; ocellar spot dark brown, connected with upper extremity of callus; lower surface of head clothed with buff-yellow hair; proximal joint of *palpi* orange-buff, clothed with buff-yellow hair, terminal joint mummy-brown or dark tawny, clothed on outer side with minute, appressed, black hairs; *antennæ* ochraceous or tawny, tip of third joint (last four annuli) clove-brown or black, first two joints clothed with minute black hairs, upper angle of second joint much produced, third joint 1·8 mm. in length, its upper branch 1 mm. in length, very slender at its distal extremity, which is curved downwards. *Thorax*: extreme front margin of dorsum showing vestiges of two paler, elongate, admedian flecks, dorsum clothed with brownish, pleuræ with buff-yellow or maize-yellow hair. *Abdomen*: black longitudinal stripes on dorsum commencing on first segment, and, if extending to distal extremity, sometimes more or less confluent on fifth and sixth segments; in other specimens stripes are interrupted on front half of fourth segment, commencing again more or less indistinctly towards hind margin of same, and thence being continued to tip of abdomen, although by no means so sharply defined as on first three segments; inner margins of stripes more or less excavated on each segment after first and consequently irregular; though widely separated from lateral margins on first two segments, stripes are more or less connected therewith on third segment, and also on following segments when stripes are prolonged to the tip; light parts of dorsum clothed with minute orange-buff hairs, more or less intermixed with minute black hairs, with which alone the black stripes are clothed; venter shining, clothed with minute, appressed, buff-yellow or orange-buff hairs. *Wings*: dark markings sharply defined and very conspicuous; costal border narrowest immediately before stigma, which is dark brown; apical blotch (extension of costal border) terminating sharply on posterior branch of third longitudinal vein, and so wide as to occupy distal three-fourths of second submarginal cell; distal margin of transverse band commencing on (occasionally just above) second longitudinal vein, at a point about two-thirds of distance between distal extremity of stigma and apical blotch; proximal margin of transverse band commencing a little beyond level of proximal end of stigma, indented in discal cell, and again, and more deeply, in fifth posterior cell; first basal cell with a minute, elongate, hyaline streak or spot in extreme base, next upper margin; fourth longitudinal vein passing through an elongate, hyaline streak just before meeting anterior basal transverse vein. *Halteres*: knobs clove-brown, sometimes paler (buff or ochraceous-buff) below, or above and below; stalks buff or ochraceous-buff. *Legs* ochraceous or tawny-ochraceous; coxæ buff; front tarsi and last joints of middle and hind tarsi black or clove-brown, third and fourth joints of middle tarsi and second, third, and fourth joints of hind tarsi dark brown; a longitudinal streak on distal portion of postero-interior surface of front tibiæ, tips of first and second joints of middle tarsi, and tip of first joint of hind tarsi on posterior side brown or brownish; coxæ and front and middle femora clothed with buff-yellow hair, tibiæ, hind femora, and first joint of hind tarsi clothed with orange-ochraceous hair.

Uganda: type and five other specimens from Mpumu, Chagwe, April, 1910 (*Captains A. E. Hamerton, D.S.O., R.A.M.C.*, and *H. R. Bateman, R.A.M.C.*).

Captain Bateman has kindly supplied the following field-note on this strikingly handsome species:—

"*Habitat*:—ford across stream bordered by forest at foot of north aspect of Mpumu Hill.

"*Dates when caught*:—April 14, 18, and 22, 1910.

"*Average climatic conditions*:—heavy rain-storms during night, followed by bright sunshine and showers during day.' Temperature 60°–80° F.

"*Habits* (so far as observed):—most active from sunrise (6.0 A.M.) to 9.0 A.M. on bright mornings; absent during rainy mornings; active again from 4.0 P.M. to 5.0 P.M.; not to be seen at mid-day. The flies are found flying low over the running stream, and alighting from time to time on the stones in the water. They attack man and beast during their active hours, and bite freely.

"*Numbers*:—fairly common.

"*Eyes in fresh state* iridescent black, or rather iridescent gun-metal colour."

The following are the chief points of difference from the South African *Rhinomyza denticornis*, Wied., presented by *Rh. perpulcra*:—third joint of antennæ (both upper and lower branches) longer and more slender; dorsum of thorax uniformly darker, without any trace of longitudinal stripes, except two admedian light flecks on extreme front margin; no longitudinal dark stripe, either partial or complete, on lateral edge of dorsum of thorax and lateral edge of abdomen; black stripes on dorsum of abdomen much broader; wings with apical blotch reaching lower branch of third longitudinal vein (instead of extending at most to middle of second submarginal cell), and transverse band connected with blotch at tip of anal cell; front tarsi entirely and tips of middle and hind tarsi black or clove-brown, instead of only tips of all tarsi being brown or brownish.

Rhinomyza concinna, sp. n.

♀.—Length (1 specimen) 12 mm.; width of head 4 mm.; width of front at vertex 0·6 mm.; length of wing 12 mm.

Dorsum of thorax cinnamon-coloured, yellowish-pollinose, with a pair of ill-defined, ochraceous-buff, admedian, longitudinal stripes, and a dark brown, median, longitudinal stripe, commencing just before level of transverse suture, very narrow for about 1 5 mm. and then suddenly expanding into an oblong blotch reaching hind margin; on each side of dorsum of thorax an elongate dark brown mark, between humeral callus and base of wing; dorsum of abdomen orange-buff, darker towards distal extremity, last three segments mainly chestnut-brown, first segment with a narrow clove-brown band of nearly uniform depth on hind border, second segment with an irregular clove-brown triangle on hind border, each lateral extremity of which is connected with one of a pair of clove-brown transverse blotches, one of which is situated on each side of third segment; wings not quite hyaline (faintly tinged with sepia), with conspicuous mummy-brown markings.

Head buff-yellow (occipital region smoke-grey), frontal callus ochraceous, shining central portion of face tawny-ochraceous, ocellar spot and a *quadrate median spot immediately above lower margin of face clove-brown*; under surface of head clothed with ochraceous hair; *palpi* tawny, terminal joint clothed on outer side with minute, appressed, black hairs; *antennæ* tawny-ochraceous, first and second joints clothed with minute blackish hairs, upper angle of second joint much produced, third joint long and slender, darker towards distal extremity and end of last annulus brown, but (in typical specimen at any rate) no sharply defined clove-brown or black tip to third joint, upper branch of third joint much as in *Rh. denticornis*, Wied., not remarkably elongate, and only about half the length of upper branch in case of foregoing species. *Thorax*: dorsum clothed with short buff-yellow hair (on lateral dark brown marks with brown hair); pleuræ buff pollinose, clothed with yellowish-white hair; *pectus dark brown*, grey pollinose. *Abdomen* (dorsal surface): first segment clothed with ochre-yellow hair, second and following segments clothed for most part with minute, appressed, blackish hairs, sides of second segment also with ochre-yellow hair; clove-brown band on first segment somewhat narrower at each side, apex of triangle on second segment reaching to about the middle, clove-brown blotches on third segment somewhat triangular in shape (at any rate in typical specimen), base of each triangle resting on lateral margin of segment and its apex pointing towards middle line, the space separating the apices equal to about one-fourth of total width of segment, lateral triangles in contact with front margin of segment for more than half their extent, but not quite reaching hind margin. *Wings*: mummy-brown markings of same type as wing-markings of foregoing species, but transverse band not connected with mummy-brown streak in apex of anal cell, and apical blotch not reaching posterior branch of third longitudinal vein; extreme base and costal cells raw sienna-coloured, proximal extremity of second costal cell tinged with mummy-brown; *stigma* ochraceous, its distal extremity mummy-brown; in proximal half of wing a mummy-brown blotch extends obliquely across bases of first and second basal cells and anal cell, and is narrower in latter, in first basal cell leaving usual minute, elongate, hyaline streak in extreme base next upper margin; there is also a transverse mummy-brown streak in apex of anal cell, next posterior branch of fifth vein; in distal half of wing mummy-brown transverse band, starting from hind margin in fourth posterior cell and overflowing somewhat into fifth posterior cell, runs obliquely forwards to costa, along which it is continued into second submarginal cell; proximal margin of transverse band runs at first in fifth posterior cell, nearly parallel to posterior intercalary vein; crossing latter and fourth posterior cell at a point about one-fourth of their length from base, it is indented in discal cell, and reaches stigma at a point about one-third of the length of the latter from its proximal extremity; distal margin of transverse band (in typical specimen at any rate) slightly sinuous, bulging forwards in first posterior cell, and turning towards tip of wing just below second longitudinal vein; apical blotch reaching not quite half-way into second submarginal cell; costa, auxiliary, and first longitudinal veins mummy-brown, other veins ochre-yellow or orange-buff, mummy-brown in portions included in dark markings. *Halteres*: knobs russet-brown, stalks buff. *Legs*: front coxæ ochraceous-buff, pollinose, clothed with pale yellowish hair; femora and middle and hind coxæ mummy-brown, former clothed with ochreous hair, tips of femora cinnamon; front tibiæ ochraceous-buff, darker at distal extremity, hind tibiæ buff, tawny-ochraceous at extreme tip on inner side (middle tibiæ and tarsi wanting in case of type); last four joints of front tarsi dark brown, first joint brown, lighter (tawny) at base; hind tarsi buff, last two joints and extreme tips of first three joints cinnamon-rufous; front tibiæ clothed with minute, appressed, maize-yellow hair, hind tibiæ and tarsi clothed with Naples-yellow hair.

Nyasaland Protectorate: West Nyasa, 1909 (*Dr. H. S. Stannus*): presented by the Entomological Research Committee (Tropical Africa).

Although somewhat resembling the South African *Rhinomyza denticornis*, Wied., in the colour of its wing-markings, *Rh. concinna* can at once be distinguished by the nature and character of the markings on the abdomen, on which longitudinal stripes are entirely absent; the presence of a clove-brown band on the first abdominal segment, apart from the dark spot on the face and various differences in the wing-markings, will serve to distinguish *Rh. concinna* from the following species.

Rhinomyza stimulans, sp. n.

♀.—Length (1 specimen) 11 mm.; width of head 3·6 mm.; width of front at vertex 0·5 mm.; length of wing 10·6 mm.

Dorsum of thorax raw-sienna coloured, entirely unicolorous, without markings; dorsum of abdomen orange-ochraceous, with clove-brown markings,—a deep transverse band, not reaching lateral margins and interrupted in middle line, occupying third segment and extending on to posterior third of second segment, and a roughly horseshoe-shaped mark, also not reaching lateral margins, with concavity directed forwards, occupying fifth and sixth segments and forming a transverse band on posterior half of fifth; wings faintly tinged with sepia, and exhibiting conspicuous dark brown markings.

Head: front buff-yellow, sides of face and jowls cream-buff, occiput smoke-grey; frontal callus and shining, tumid, central portion of face ochre-yellow; ocellar spot dark brown, face unspotted; under surface of head clothed with pale yellowish hair; proximal joint of *palpi* buff, terminal joint ochraceous-buff, clothed on outer side with minute, appressed, brown or dark tawny hairs; *antennæ* ochraceous-buff, first and second joints clothed with minute brown hairs, upper angle of second joint moderately produced, third joint with apical annuli black and with very long upper branch. *Thorax*: dorsum clothed with buff-yellow hair; pleuræ and pectus cream-buff, clothed with pale yellowish hair. *Abdomen*: dorsum clothed for most part with ochre-yellow hair, on dark markings with dark brown hair; anterior margin of interrupted transverse band on second and third segments curved, with convexity directed forwards, inner margins of band emarginate on third segment (at least in typical specimen); anterior extremities of horseshoe-shaped mark visible through hind margin of fourth segment (at least in case of type), so that on a cursory inspection this segment appears to have two small dark blotches on its hind margin; venter shining ochraceous-buff, without markings, clothed with appressed ochre-yellow hair. *Wings*: markings of same general type as in previous species, but transverse band narrower, and apical blotch reaching posterior branch of third longitudinal vein; extreme base and costal cells mummy-brown, remaining markings and *stigma* dark sepia-coloured or clove-brown; "remaining markings" occupy apex of anal cell, proximal two-fifths of second basal and rather more than proximal half of first basal cell, and also include transverse band and its extension along costa and into second submarginal cell; first basal cell with usual, minute, hyaline streak at its extreme base; dark brown blotch in apex of anal cell slightly overflows sixth longitudinal vein into axillary cell; transverse band starts from hind margin of wing in lower distal angle of fifth posterior cell, passes over posterior transverse vein and is indented in discal cell, then becomes broader and reaches costa, its proximal margin meeting second longitudinal vein slightly basad of distal extremity of auxiliary vein, and its distal margin, which is indented in first submarginal cell, meeting second longitudinal vein slightly beyond level of distal extremity of stigma; from point at which proximal margin of transverse band meets second longitudinal vein to distal extremity of marginal cell latter is entirely dark brown, though (in typical specimen, at any rate) there are traces of an ill-defined paler area in marginal cell immediately above space separating transverse band from apical blotch; from distal extremity of marginal cell, costal extension of transverse band is continued downwards to form apical blotch, becoming broader immediately below second longitudinal vein (its proximal margin crossing anterior branch of third longitudinal vein at a point about one-fourth of the length of the branch from its base), and terminating on posterior branch of third vein; veins orange-ochraceous, costa, auxiliary, and first longitudinal vein, and other veins where covered by dark markings, dark brown or clove-brown. *Halteres*: knobs orange-buff, stalks buff. *Legs* buff-yellow or orange-buff; front tarsi clove-brown, last three joints and tips of first two joints of middle and hind tarsi mummy-brown.

Northern Nigeria: R. Benue, between Bagana and Lokoja, March, 1907 (*Dr. G. J. Pirie*).

The collector's field-note attached to the type is as follows:—

"Caught on a sand-bank in the evening, while we were sitting out by lamp-light: bit a European."

The present species may be distinguished from the foregoing (*Rh. concinna*, Austen) by the absence of markings on the thorax and of a dark transverse band on the first abdominal segment, as also by the band on the second (as well as that on the third) abdominal segment being interrupted in the middle line; as regards the wings, the markings in the distal half are darker in *Rh. stimulans* than in *Rh. concinna*, while the transverse band is narrower, and the apical blotch reaches the posterior branch of the third longitudinal vein, instead of terminating a little before the middle of the second submarginal cell.

Rhinomyza stimulans is closely allied to a new species of the same genus found in Southern Nigeria, of which a ♀ from Agbabu, S. Nigeria, 23. iv. 1909 (*Dr. Hannington*), is in the possession of the Liverpool School of Tropical Medicine. Apart from its larger size (length 13·5 mm., wing-expanse 26·3 mm.), the Liverpool specimen is distinguished by its darker colour (dorsum of thorax mummy-brown), dark brown antennæ, shorter and stouter first antennal joint, second antennal joint having its upper angle much more produced (continued into a long point), and, in the wing, by the brown blotch in the tip of anal cell extending to the hind margin and filling up rather more than the distal third of the axillary cell. In the shape of the frontal callus, general pattern of the wing-markings, and general shape and extent of the dark bands on the abdomen the two species are alike.

XXXIX.—*Descriptions and Records of Bees.*—XXXIII.

By T. D. A. Cockerell, University of Colorado.

Callomelitta turnerorum, sp. n.

♀.—Length about 7½ mm.

Thorax, legs, and abdomen entirely bright rufo-fulvous; head black, with the lower margin of clypeus, labrum, and the bidentate mandibles ferruginous; antennæ fulvous, the flagellum thick, its middle sutures somewhat constricted beneath; eyes large; face narrow, facial quadrangle very much longer than broad; hair of face not dense enough to hide surface, pale, with a silvery lustre and a slight yellowish tint; clypeus, face, and front strongly and densely punctured; sides of vertex shining, with strong well-separated punctures; cheeks small, hardly half diameter of eye; mesothorax and scutellum shining, with distinct well-separated punctures; scutellum with pale yellowish hair; area of metathorax broadly triangular, smooth and shining, without sculpture; sides of metathorax with two little projecting points, as in *Binghamiella.* Legs with thin pale golden hair; tegulæ clear rufo-fulvous. Wings hyaline but hairy, the apex broadly dusky, including apical part of marginal cell; stigma and nervures ferruginous; stigma large; lower section of b. n. gently arched, falling a little short of t.-m.; second s.m. much higher than broad, twice as broad below as above, and receiving first r. n. in middle; third s.m. also higher than broad. Abdomen broad, shining, with sparse inconspicuous pale yellowish hair; third segment with evident punctures.

Hab. Cairns, Queensland, "Kur. 3. 02" (*G. & R. Turner*). British Museum.

A very distinct species, easily known by its peculiar colour. It is in some ways intermediate between *Callomelitta* and *Binghamiella.* The metathorax and comparatively small size suggest *Binghamiella,* but the venation is different and more like that of *Callomelitta.* The peculiar coloration recalls *Halictus rowlandi* and *Parasphecodes contaminatus,* also found at Cairns.

Exoneura bicolor, Smith.

Smith based this genus and species on the female only. *E. pictifrons,* Alfken, may be its male, it is from S.W. Australia; and Swan River must apparently be considered the type locality of *E. bicolor*, as it is the first of the two localities cited. A male in the British Museum from Victoria (*C. F.*, Sept. 1901, Turner Collection) may belong to *bicolor* or to *hamulata*—more probably, I think, to the latter, as it has the scape entirely dark, the first abdominal segment black above, and the second very largely black. The eyes are extremely large and prominent, and the face is very narrow, narrower in the middle than the width of an eye; clypeus pale yellow; yellow lateral face-marks narrow, not nearly reaching level of top of clypeus, the black interval between them and clypeus about as broad as they are; face and vertex with long black hair; antennæ wholly dark; flagellum thick, only moderately long; abdomen claviform, slender basally; hind tibia claviform, with a broad black band behind; hind basitarsus thick, sausage-shaped. There is a fringe of curled dark bristles at the end of the abdomen, such as may be seen in male *Allodape*.

EURYGLOSSIDIA, gen. nov.

Bees superficially resembling *Parasphecodes*, but with the tongue *Colletes*-like in both sexes, and only two submarginal cells. From *Euryglossa* they are separated by the venation of the long and ample wings; lower section of basal nervure only gently arched, falling only a little short of t.-m.; submarginal cells both very long; second s.m. receiving first r. n. at a distance from its base equal to about half of first t.-c.; *apical section of second r. n. vertical*, joining second s.m. a short distance from end, the angle formed a right angle; *second s.m. narrowed above*, the second t.-c. forming less than a right angle on outer side with marginal; lower side of first s.m. almost straight; stigma longer. Hind spur of female with four long slender dark spines, the other spurs minutely spinulose; hairs of hind tibial scopa long-branched. Palpi essentially as in *Euryglossa*, except that the joints of the maxillary palpi are much longer, and the last joint is much longer than the penultimate.

Smith described two Australian bees as *Scrapter bicolor* and *S. carinata*. The name *bicolor* being preoccupied, it was altered by Dalla Torre to *australiensis*. Vachal, in 1897, proposed a generic name *Smithia* for these bees, but did not give any generic characters, and apparently acted simply from a sense of the improbability of the Australian insects belonging to *Scrapter*. *Smithia* being preoccupied, W. A. Schulz in 1906 substituted *Melittosmithia*.

There can be little doubt, I think, that these are Euryglossine bees. No type for *Smithia* or *Melittosmithia* has been designated; I therefore name *carinata* (Smith), the first species cited by Schulz, as the type.

This insect seems from the description to be related to *Euryglossa froggattiana*, Ckll., which is by no means a typical *Euryglossa*. *Melittosmithia*, thus interpreted, is quite distinct from *Euryglossidia*, but it may be that the other species, *australiensis*, belongs to the latter genus.

Euryglossidia rectangulata, sp. n.

♀.—Length about 8 mm.

Head and thorax black, quite hairy; abdomen very bright chestnut-red, with a large round black spot on each side of second segment; femora black, with the knees ferruginous; tibiæ and tarsi ferruginous, more or less suffused with dusky; tegulæ ferruginous. Wings pale reddish, stigma and nervures ferruginous. Head broad; mandibles dark, strongly grooved; clypeus shining, with strong sparse punctures; supraclypeal area shining, punctured only at sides; sides of face shining, but front and vertex dull and granular; no definable facial foveæ; hair of cheeks and underside of thorax greyish white; hair of face partly fuscous and partly pale, of vertex behind ocelli long and dark fuscous; flagellum dull red beneath; mesothorax and scutellum dull, minutely tessellate, with scattered very weak punctures; hair of thorax above greyish, mixed with dark fuscous; metathorax essentially as in *Euryglossa*, the basal area large, triangular, dull and rough basally, more shining beyond; scopa of hind femora white, but the large plumose scopa of hind tibiæ grey; hind basitarsus longer than the other joints together. Abdomen smooth and shining, the hair at apex strongly stained with fuscous.

♂.—Much more slender; the abdomen claviform, slender basally; the abdomen is variably suffused with black and has a faint purple lustre, the second segment is the least darkened; stigma and nervures rufo-fuscous; face broad; clypeus covered with white hair; flagellum long, very obscure reddish beneath; ocelli prominent.

Hab. Victoria (*C. F.*, Feb. 1901; Turner Collection); 3 ♀, 2 ♂. A female is the type.

E. rectangulata is the type of the genus. Another species is *Euryglossidia ichneumonoides* (*Euryglossa ichneumonoides*, Ckll., 1906).

Megachile kurandensis, sp. n.

♂.—Length about 8½ mm.

A short broad species, the anterior tarsi simple but robust, with long pale fulvous hair behind. Black; ventral pubescence of head and thorax white, a very large thick beard on lower side of cheeks; face densely covered with golden-fulvous hair; vertex with long black hair; head ordinary; mandibles and antennæ black; hair of thorax above and pleura mainly black (long on scutellum), but fulvous on tubercles, at corners of mesothorax, in scutello-mesothoracic suture, and behind scutellum; mesothorax well punctured, the punctures separate; tegulæ piceous. Wings dusky in marginal cell and throughout the apical region; b. n. not reaching t.-m.; second s.m. a little broader below than first. Legs ordinary, inner side of tarsi, and of tibiæ more or less, with fox-red hair. Abdomen with pale fulvous hair (like that of metathorax) at base; segments 2 to 4 with apical bands of bright golden-fulvous or golden-orange hair, fifth with about the apical two-thirds covered with such hair, and sixth entirely covered; margin of sixth very obtusely binodulose; no ventral spine; anterior coxæ unarmed, but with a large tuft of hair.

This may be compared with *M. sequior*, Ckll., but the latter has a pair of well-developed teeth on the sixth abdominal segment.

Hab. Kuranda, Cairns, Queensland, Jan. 1902 (*Turner*). British Museum.

Megachile eucalypti, sp. n.

♀.—Length about 10 mm.

Black, parallel-sided, with the last three abdominal segments clothed with scale-like fulvous hair, which is so distributed that the surface appears minutely black-speckled, the tegument showing through; head large, facial quadrangle longer than broad; mandibles black, quadridentate; clypeus low and broad, strongly and very densely punctured, the lower margin shining, and slightly crenulate; sides of face with much white hair; flagellum obscurely reddish beneath; vertex densely and strongly punctured; thorax with four small but very dense and conspicuous tufts of white hair, one at each side of prothorax and one at each posterior corner of mesothorax; tubercles also with a dense white tuft, and one behind and a little below wings; mesothorax and scutellum strongly, extremely densely punctured; tegulæ piceous. Wings slightly dusky, with a darker streak in marginal cell; second s.m. very long. Legs ordinary; spurs pale. First abdominal segment with a conspicuous patch of white hair on each side; first three segments with apical, greyish, slightly fulvous-tinted hair-bands, that on first failing laterally; ventral scopa entirely white.

♂.—Length about 8½ mm.

Long and narrow, in most respects like the female; face densely covered with shining white hair; thoracic hair-spots smaller or even absent; vertex, mesothorax, and scutellum with a good deal of dark fuscous hair; flagellum long and slender; anterior femora with long white hair behind and yellowish white in front, and beneath with a very well-defined oblique band of pure white felt or tomentum; anterior tibiæ reddish brown in front and near base, very thick, bulging and almost angular behind, posteriorly with an even brush-like fringe of fulvous-tinted hair; the inner edge of the anterior femora has a white tegumentary band, while the tibiæ, seen from within, are shining white, with a black margin, the apical end pale fulvous; anterior tarsi very extraordinary, being broadly expanded, the main part of the joints black, with a short silvery hair-fringe in front, but the expanded lamina white, with a broad black stripe along the posterior margin; the expanded white part of the third joint looks greyish exteriorly, having on the inner side a very large long-oval black spot; ferruginous claws are almost sessile on this great expanded structure; anterior coxæ with much white hair, but no spines, their trochanters beneath red; middle and hind knees red, their tibiæ more or less reddish, their tarsi entirely red; no band on first abdominal segment; sixth segment obtusely binodulose, the small nodules close together; no ventral spines.

This species resembles *M. nigrovittata*, Ckll., and *M. modesta*, Sm. The male is easily known by the extraordinary anterior legs. The female is known from such species as *M. rhodura*, Ckll., and *M. gilbertiella*, Ckll., by having the red or orange colour of the apex of the abdomen wholly due to hair.

Hab. Mackay, Queensland; female at flowers of *Eucalyptus*, Dec. 1899 (*Turner*, 291); males, April 1899 and Sept. 1900 (*Turner*, 5 *a*). British Museum.

Megachile serricauda, sp. n.

♂.—Length about 8 mm.

A short, rather robust insect, resembling the group of *M. macularis*, *sequior*, *cygnorum*, and *kurandensis*, but the thorax without hair-spots, and the margin of the sixth abdominal segment strongly but irregularly dentate or serrate, with a rounded central emargination. Black, with the dorsal pubescence fulvous and the ventral white; face densely covered with golden-fulvous hair; mandibles black, faintly reddish toward the apex, very hairy; eyes green; antennæ black; vertex closely punctured, but shining; mesothorax and scutellum dull, very densely and minutely punctured; fulvous hair of thorax abundant. Legs ordinary, except that the very hairy anterior basitarsus has a large, deep, hairless excavation or groove on the inner side; anterior coxæ with strong but only moderately long black spines; middle and posterior tarsi with long white hair; tegulæ fuscous, paler at sides. Wings somewhat dusky. Abdomen shining, the hind margins of the segments with dense entire fulvous hair-bands; fifth segment with much fulvous hair basally, sixth covered with fulvous hair above, except apically; no ventral spine.

Compared with *M. kurandensis*, the antennæ are shorter in proportion and the ocelli are quite different. In *kurandensis* the ocelli are close together and the interocellar distance is less than that from lateral ocelli to eye or from ocelli to occipital margin, the vertex being broad. In *M. serricauda* the ocelli are wide apart, the interocellar distance being a little greater than the distance from ocelli to eye and much greater than that to occipital margin.

Hab. Mackay, Queensland, May 1900 (*Turner*). British Museum.

Megachile gilbertiella, sp. n. (vel *apicata*, subsp.?).

♀.—Length about 8 mm.

Black, parallel-sided, with the tegument of the fifth abdominal segment and rather more than the apical half of the fourth bright ferruginous; ventral scopa white, fulvous on apical segment; anterior margin of clypeus with two widely separated short teeth and a slight prominence in the middle between them.

This is certainly very close to *M. apicata*, Smith, but does not wholly agree with the description, and is from a very different locality. There is also some resemblance to *M. stalkeri*, Ckll., but comparison of types brings out important differences.

Head large; mandibles black; clypeus densely punctured; face and cheeks with white hair; flagellum dark brownish beneath; front and vertex with strong and dense but distinct punctures; mesothorax and scutellum with similar punctures, shining between them; white thoracic hair-spots as in *M. eucalypti*; tegulæ very dark. Wings rather dusky; second s.m. very long. Legs ordinary, with white hair, that on inner side of tarsi yellowish. Abdomen shining, strongly punctured; first segment with a triangular patch of dense white hair on each side; second to fourth segments with marginal hair-bands, broad and white at sides, linear and more or less yellowish in the middle; bases of segments also with pale hair; scale-like hair peppered over the last two segments fulvous.

Hab. Cooktown, Queensland, Oct. 1902 (*Gilbert Turner*). British Museum.

Megachile oculipes, sp. n.

♂.—Length about 10 mm.

Black, parallel-sided, rather narrow; hair of head and thorax white except on the broad vertex, where it is fulvous; head broad; eyes green, stained with blood-red; abundant hair of face greyish white; lower edge of clypeus with two small teeth; mandibles black, tridentate; vertex and front coarsely granular or rugoso-punctate; scape short, entirely bright ferruginous; flagellum long and slender, black above, ferruginous beneath except the last three joints; mesothorax and scutellum densely rugoso-punctate; little tufts of white hair on tubercles and posterior angles of mesothorax, but not forming conspicuous spots; hair of cheeks beneath abundant and pure white; tegulæ brown. Wings hyaline; a fuscous streak in marginal cell. Anterior coxæ apparently spined (the insect is carded, and they are hard to see); anterior femora red in front and behind, with much white hair; their tibiæ entirely bright red; their tarsi clear red, basally with long reddish (the first two or three black) hairs behind, and beyond that with a very large oval lobe, which is white, with a grey centre, simulating an eye; the grey centre is, of course, represented by a black spot beneath (compare *M. eucalypti*); middle femora red in front; their tibiæ thick, red, with a broad black band behind; their tarsi very thick, black, except the apex of the last joint, with the claws; hind legs black, the tarsi thick; hind spurs piceous. Abdomen shining, strongly punctured, base with loose white hair; hind margins of first three segments with white hair-bands; black parts (especially fourth segment) with short black hair; apical segments with silvery hair, not dense; margin of sixth segment truncate.

Known by the structure of the front legs and the end of the abdomen without red. The colour of the middle tibiæ, scape, &c. readily separate it from *M. vestitor*, Ckll., *lineatipes*, Ckll., and *latipes*, Sm.

Hab. Townsville, Queensland, 12. 2. 03 (*F. P. Dodd*). Turner Collection; British Museum.

Megachile lineatipes, sp. n.

♂.—Length about 10½ mm.

Black, broad and robust; eyes green, converging below; face covered with long cream-coloured hair; mandibles black; vertex densely punctured, its hair partly fuscous; antennæ black; hair of thorax white below, greyish white above, long and black on disc of scutellum and largely black on mesothorax; mesothorax and scutellum very densely rugoso-punctate; tegulæ piceous. Wings dusky. Anterior coxæ with long curved black spines, which are reddish at extreme tip; anterior part of coxa yellowish, with a comb of four long ferruginous linear spines; anterior femora ferruginous (blackened behind apically), greatly flattened and expanded, sharply keeled below, and obtusely angulate toward base, the basal half of the broad inner surface with fine zebra-like black lines or stripes; their tibiæ trigonal, very short and thick, the outer surface (except the anterior apical corner very broadly) black or nearly, the inner apical margin blackened; their tarsi cream-colour, flattened and expanded, with an oval reddish lobe about the middle anteriorly, and behind with a long pale fringe, the hairs fuscous-tipped; on the inner edge (especially on the basitarsus) is a fringe of stiff black hairs; the other legs are black, with white hair, yellowish on inner side of tarsi; hind tarsi very thick; spurs black. Abdomen short, with black hair, white and loose on first segment; segments 2 to 4 with narrow white hair-bands; apical half of fifth segment in middle, and sixth above, except apically, clothed with pale fulvous hair; sixth with two very strong teeth or spines, wide apart; no ventral spine.

Readily separated from *M. latipes*, Sm., by the two sharp teeth at end of abdomen. It is really much closer to *M. chrysopyga*, but has the anterior tarsal lobe paler and much more reduced than in that species. It is even nearer to *M. phenacopyga*, but distinct by the anterior legs.

Hab. Kuranda, Cairns, Queensland, Jan. 1902 (*Turner*). British Museum.

The specimen is also marked E, which may refer to the collector.

Megachile sericeicauda, sp. n.

♂.—Length 9–10½ mm.

Black, without any red at apex of abdomen; eyes doubtless red in life, in the dry state reddish grey; facial quadrangle much longer than broad, little narrowed below; face densely covered with fulvous hair; mandibles black; labial palpi with first joint robust and dark, the others pallid; cheeks broad, with much white hair below; antennæ black, flagellum long; vertex broad, with dark fuscous hair; punctures of vertex small and dense on each side of ocelli, larger and sparser (the shining surface showing) posteriorly; mesothorax densely and coarsely punctured; hair of thorax white, without any yellow tint, shining silvery on scutellum, but black or dark fuscous on anterior middle of mesothorax; tegulæ piceous. Wings strongly dusky, upper half of marginal cell fuliginous. Legs black, with white hair; anterior tarsi simple, hair on inner side of tarsi yellowish; anterior coxæ simple, very hairy; hind spurs black. Abdomen shining, with very large distinct punctures; hair short and black, loose and white at base of first segment; a dense triangular patch of pure white hair at each side of first segment (compare *M. gilbertiella*); no hair-bands; middle of sixth segment with appressed silky-white hair, and a little of the same on fifth; margin of sixth very obtusely bilobed, the actual margin of sixth (beneath) has a pair of angular projections; last ventral with a broad whitish margin.

Hab. Mackay, Queensland (*Turner*). British Museum. The type is marked 10*a*, and was taken in Sept. 1900. Others were taken in October 1901.

Easily known from *M. austeni*, Ckll., by the large distinct punctures of the abdomen.

The following table separates several males in which the apex of the abdomen is not red (although in *lineatipes* there is a pale fulvous hair-patch):—

	Anterior tarsi greatly modified	1.
	Anterior tarsi simple; sixth abdominal segment not spined	4.
1.	**Middle tibiæ bright red in front; scape bright red.**	*oculipes*, Ckll.
	Middle tibiæ dark	2.
2.	**Sixth abdominal segment with a median sharp point**	*vestitor*, Ckll.
	Sixth segment without such a point...........	3.
3.	**Sixth segment with two sharp teeth**	*lineatipes*, Ckll.
	Sixth segment without such teeth	*latipes*, Sm.
4.	**Abdomen with large distinct punctures**	*sericeicauda*, Ckll.
	Abdomen with small indistinct punctures	*austeni*, Ckll.

Trigona longipes, Smith.

I have a Brazilian specimen from F. Smith's collection. I believe there is no doubt that Smith's *longipes* of 1854 and 1863 are the same insect; hence the name *longicrus*, Dalla Torre, falls as a synonym.

Trigona laboriosa, Smith.

A specimen from Smith's collection appears to me to be identical with *T. fulviventris*, Guér., as represented by Baker at Belize. *T. laboriosa* was described from Panama.

Trigona guianæ, sp. n.

Worker.—Length about 7 mm.; anterior wing about 7 mm. Head and thorax black; abdomen exceedingly shiny, the dorsal surface very dark brown, without hair; legs black, the last tarsal joint reddish, that of hind legs clear ferruginous. Head large, face broad; sides of face greyish-white pruinose; no pale markings on head or thorax; mandibles dark reddish, strongly dentate; cheeks (except below, where they are shining) densely covered with grey tomentum; clypeus and front shining; antennæ black or almost above, pale ferruginous beneath, including scape; mesothorax and scutellum shining; thorax with scanty short whitish tomentum, more abundant at sides of metathorax, but vertex, mesothorax, and scutellum with erect black hair; tegulæ piceous, faintly reddish. Wings uniformly yellowish dusky, not dark, stigma and nervures pale honey-colour. Knees slightly reddish; legs with black hair; hind tibiæ slender at base, gradually widening to the broadly truncate end.

Hab. Guiana. British Museum, 96. 238.

T. mombucæ, Sm., has the same grey cheeks, but the antennæ are dark, the posterior margin of the hind tibia is more convex, and the third and fourth abdominal segments are mainly ferruginous. *T. fuscipennis*, Friese, is also allied, but differs by the dark antennæ and the dark basal part of wings. I do not know how to separate *fuscipennis* from *amalthea*, Oliv.; at least an *amalthea* from Smith's collection seems to be the same as *fuscipennis* from Venezuela (*Kummerow*), received from the Berlin Museum.

XL.—*On a new Genus and Species of the Order* Solifugæ *from Algeria.* By S. Hirst.

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Barrella, gen. nov.

Anterior margin of head-plate only slightly curved and furnished on either side of the ocular tubercle with a series of five strong spines, which are placed on a slight eminence. Ocular tubercle only slightly prominent in front and furnished with a number of strong anterior spines and a few bristles also. Inner surface of chelicera smooth and devoid of stridulatory ridges; in the male a membranous plate and a rather narrow membranous flagellum are present, and the dorsal surface of the immovable finger has a forwardly-directed process. Tibia of maxillipalp in the male with a swelling on the inner side, which is armed with spines and strong spiniform bristles. Tarsi of the legs each with a single segment.

Barrella walsinghami, sp. n.

♂.—*Head-plate* convex and a little wider than long, the anterior margin almost straight, and furnished on either side of the ocular tubercle with an oblique series of five strong divergent spines, which are of equal length and are situated on a slight common elevation. Ocular tubercle of fairly large size and projecting well in front of the anterior margin of the head-plate; its anterior surface is only very slightly prominent, and bears seven strong spines and two or three fine bristles as well (fig. 1).

Fig. 1.

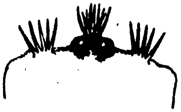
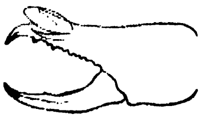


Fig. 2.



Barrella walsinghami, sp. n.

Fig. 1.—Anterior end of head-plate of male from above.
Fig. 2.—Chelicera of male from inner side. (The hairs on the wing-shaped plate are not shown.)

Abdomen.—Third segment furnished, on either side of the stigmata, with a transverse series of curved spines (five in number on each side in perfect specimens?), some of which are much stouter than the others. Fourth segment with a transverse series of fine setæ.

Chelicera furnished with two strong spines at the side above. Immovable finger strongly curved at the end; its edge is armed with a series of about twelve minute teeth, commencing at a considerable distance from the point; the first (front) tooth is the largest and the fourth is the next largest; the anterior of the two intermediate teeth is very minute. Dorsal process of immovable finger slender and much shorter than the terminal part of the finger. Edge of movable finger furnished in the middle with two slight and inconspicuous teeth, which are placed at some distance from one another.

A thin, hairy, wing-shaped plate is present on the inner side of the chelicera; the flagellum, which arises just below this plate, is shorter than it, and is rather narrow and shaped rather like a horn (fig. 2).

Maxillipalp.—Tarsus unarmed and fairly short. Tibia shorter than the patella and swollen on the inner side, the swelling being furnished with seven or eight spines, which, with the exception of the two upper ones, are rather long; another fairly long spine is present a little in front of the others at a short distance from the apex of the segment.

Colour yellowish; ocular tubercle black; abdomen apparently a little darkened both above and below; patella, tibia, and tarsus of maxillipalp pale brown, the tibia and tarsus being a little darker than the patella; distal end of the femur and the patella of the fourth leg also pale brown in colour.

Size.—Length of the body 11·25 mm.

Material.—A single male example, captured near Biskra, Algeria, in 1903 by Lord Walsingham.

Remarks.—This new genus is closely allied to the Egyptian genus *Barrus* and to the genus *Rhinippus*, Werner (inhabiting Asia Minor), each of which contains only a single species. It differs from *Barrus* in having the anterior margin almost straight and in having the spines of the head-plate placed on a slight eminence, their bases being situated close together. From *Rhinippus* it differs in the larger number of the spines on the ocular tubercle, in the presence of spines on the head-plate, and in the possession of a flagellum.

XLI.—*Rhynchotal Notes.*—LII. By W. L. DISTANT.

Australasian Pentatomidæ.

KUMBUTHA, gen. nov.

Head large, about as long as broad, the lateral margins oblique, slightly sinuate, the apex subtruncate, slightly rounded, the apical area distinctly foveately depressed; eyes substylate, a little curved backward, situate at or very near base; antennæ five-jointed, basal joint stout, not reaching apex of head, second and third subequal in length, third stouter than second, both shorter than fourth and fifth, which are stouter and also subequal in length; pronotum longer than head, anterior margin and posterior margin before scutellum truncate, lateral margins almost straightly oblique, distinctly and somewhat broadly grooved, more distinctly so anteriorly, the anterior angles moderately, laminately, convexly produced; scutellum not quite reaching the abdominal apex, slightly sinuate near base, the apex broadly rounded; corium exposed for about half the length of scutellum; connexivum exposed for the posterior half; rostrum slightly passing the posterior coxæ; abdomen short; femora slightly incrassated; tarsi three-jointed, third joint about as long as first and second together.

I do not know any very close ally of this genus. It may be placed in the neighbourhood of *Phimodera*.

Kumbutha quadrinotata, sp. n.

Head coarsely punctate, black, with fine obscure oblong brownish-ochraceous spots—three near base and two near apex; pronotum thickly coarsely punctate, pale ochraceous, a large transverse subquadrate spot on each side of anterior area, a fine central longitudinal line, on each side of which on posterior half is an oblique line, followed by a small spot between it and the posterior angle, piceous or black, on the disk two central small shining stramineous levigate spots, the anterior and lateral margins also very narrowly of the same colour; scutellum thickly coarsely punctate, pale ochraceous, much mottled with blackish, especially in the central and posterior lateral areas, on each side of base near basal angles a small narrow longitudinal shining stramineous levigate spot; exposed corium pale ochraceous, thickly darkly punctate; antennæ black, the first and second joints brownish ochraceous; body beneath blackish, abdomen with a marginal segmental series of small ochraceous spots; femora black, their extreme apices and the tibiæ and tarsi ochraceous, bases of tibiæ and apices of tarsi blackish; other structural characters as in generic diagnosis.

Long. 3½ mm.

Hab. Queensland; Townsville.

IPPATHA, gen. nov.

Body ovate, moderately convex; head large, broader than long, as long or almost as long as the pronotum, the lateral margins obliquely convex, a little ampliately reflexed, the lateral lobes a little longer than the central lobe and almost meeting beyond it; eyes prominent, a little upwardly and backwardly directed, at base between the eyes moderately convexly tumid; antennæ inserted about midway between lateral margins and rostrum and considerably before eyes, five-jointed, basal joint not reaching apex of head, second, third, fourth, and fifth joints almost subequal in length; rostrum reaching the posterior coxæ, bucculæ almost reaching base of head; pronotum twice as broad as long, anterior margin straightly truncate, lateral margins straightly oblique and moderately ampliately recurved, posterior margin nearly straight, the disk anteriorly deflected; scutellum almost reaching the abdominal apex, considerably longer than broad, lateral margins nearly straight, apex rounded, marginal area of corium exposed outside two-thirds the length of scutellum; connexivum exposed at about one-third from base to apex; orifices small, not continued in a longitudinal sillon; femora moderately thickened, the anterior femora a little curved; tarsi three-jointed, posterior tarsi with the basal joint about as long as second and third together. Wings with the veins "primaria et subtensa," subparallel; hamus absent.

A genus of Graphosomatinæ, with no immediate ally; the large rounded head is a very distinctive character.

Type, *I. australiensis*, Dist.

Ippatha australiensis, sp. n.

Ochraceous, fasciated with black; head above (excluding lateral areas), pronotum with a transverse fascia before middle on each side continued backward to base near posterior angles, scutellum with two central longitudinal fasciæ which are moderately narrowed at apices, a longitudinal fascia on each side of exposed corium adjoining scutellum and which is more narrowly continued on inner margin of connexivum, head beneath with a longitudinal median fascia, a submarginal longitudinal fascia extending from behind eyes to apex of abdomen, a central longitudinal fascia to sternum and abdomen, coxæ, femora excluding apices and rostrum, black; antennæ testaceous, second and third joints subequal in length, fourth and fifth also subequal but a little longer and thicker than the two preceding joints; above and beneath distinctly, coarsely, somewhat sparsely punctate, some levigate macular areas at base of scutellum; tibiæ finely setose; other structural characters as in generic diagnosis.

Long. 9½ mm.

Hab. North Australia; Alexandria (*W. Stalker*, Brit. Mus.), Centr. Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

Ippatha ornata, sp. n.

Head above black, thickly punctate, the lateral and apical margins narrowly ochraceous; eyes piceous; pronotum pale ochraceous, darkly punctate, the anterior margin palely levigate, behind which is a transverse black fascia laterally and posteriorly palely levigately margined, the lateral marginal areas are distinctly laminately reflexed and behind eyes impunctate; scutellum black, thickly coarsely punctate, with three longitudinal pale ochraceous fasciæ, one central, the others lateral, the central levigate, the lateral sparsely irregularly punctate; the exposed corium pale ochraceous, darkly punctate; body beneath black, more or less thickly finely punctate; lateral margins of sternum and abdomen, a sublateral fascia on each side of abdomen, acetabula and the coxæ very pale ochraceous, levigate, excepting the acetabula which are darkly punctate; legs testaceous, femora more darkly macularly punctate; rostrum testaceous, its apex piceous and reaching the posterior coxæ; antennæ testaceous, second joint longer than third, fourth and fifth longest and subequal in length.

Long. 5½ mm.

Hab. Queensland; Peak Downs.

Genus DANDINUS.

Dandinus, Dist. Ann. & Mag. Nat. Hist. (7) xiii. p. 264 (1904).
Testricoides, Schout. Ann. Soc. Ent. Belg. xlix. p. 144 (1905); id. in Wytsm. Gen. Ins. fasc. 30, p. 26 (1905).

Dr. Schouteden, to whom we are indebted for an excellent revision of the Graphosomatinæ, placed his genus in that subfamily of the Pentatomidæ; I had previously placed it in the Pentatominæ, led thereunto by carded specimens only. When the wings of many Pentatominæ are examined we may expect more inclusions into the Graphosomatinæ, which is at present, with many genera, a somewhat difficult problem, if the wing-neuration is to be the dominant factor.

Dandinus crassus.

Dandinus crassus, Dist. Ann. & Mag. Nat. Hist. (7) xiii. p. 265 (1904).
Testricoides pulcherrimus, Schout. Ann. Soc. Ent. Belg. xlix. p. 144 (1905); id. in Wytsm. Gen. Ins. fasc. 30, p. 26, pl. ii. f. 8 (1905).

Hab. Queensland, Townsville (*Dodd*, Brit. Mus.), Victoria (*fide* Schouteden).

The British Museum possesses a second species from Hermannsburg, Central Australia, of a testaceous coloration, but not in sufficiently good condition for description.

DIPPILANA, gen. nov.

Head almost as long as broad, considerably narrowed anteriorly, but with the apex broad, subtruncate, the lateral lobes passing the central lobe, but not meeting beyond it, their apices broad, obliquely truncate, lateral margins a little reflexed, oblique, very slightly sinuate, basal area distinctly gibbous; ocelli near eyes, well separated from base; eyes moderately large, not extending beyond the anterior pronotal angles; antennæ robust, five-jointed, inserted a little nearer to apex than to eyes, first joint thickened, attenuated at base, moderately curved, about as long as head but extending far beyond it, second joint small, scarcely more than half the length of first, third longest, fourth a little longer than fifth; pronotum half as long as broad at base, lateral margins oblique, scarcely sinuate, anterior third obscurely crenulate, posterior angle subangulate and subprominent, anterior margin concave, posterior margin truncate before scutellum; scutellum longer than broad, apical area narrowed and subangularly rounded; corium almost as long as scutellum and pronotum together, costal margin distinctly moderately convexly rounded, its apical angle truncate; membrane small, about half the length of corium, veins prominent and longitudinal; rostrum just passing the posterior coxæ, first joint reaching base of head, second joint reaching the anterior trochanters, third distinctly longer than fourth; abdomen beneath distinctly centrally sulcate near base; legs of moderate length, posterior tarsi with the basal joint about as long as second and third joints together; odoriferous aperture short, transverse, angulate exteriorly.

This genus may be placed near *Pœcilotoma*, Dall.

Dippilana membranacea, sp. n.

Head above ochraceous, with four longitudinal series of brownish punctures; eyes black; antennæ dull deep ochraceous, very shortly finely pilose; pronotum ochraceous, thickly coarsely punctate, the punctures a little less dense on central disk, where there is a central longitudinal impunctate fascia and a narrower oblique impunctate fascia before each lateral margin, the region of the cicatrices also transversely ochraceous, impunctate; scutellum coarsely brownly punctate, a central fascia not reaching apex, a spot at each basal angle, the lateral margins (narrowly) and the apex (broadly) ochraceous, impunctate; corium coarsely brownly punctate; membrane pale brownish with the veins very broadly black; body beneath and legs pale ochraceous; coxæ, prosternum, and metasternum punctate; mesosternum with a longitudinal sublateral cluster of black punctures on each side; legs closely finely speckled with testaceous, pilose beneath.

Long. 14½ mm.; exp. pronot. angl. 8 mm.

Hab. S. Centr. Australia; Killalpanima, 100 miles E. of L. Eyre (*H. J. Hillier*, Brit. Mus.).

MURITHA, gen. nov.

Closely allied to *Alcæus*, Dall., but differing principally by the antennæ, in which the second joint is not about half the length of the first, but nearly twice as long and flattened and roundly ampliate at base, third joint shorter than second, remaining joints or joint mutilated in type.

Type, ***M. hermannsburgi***, Dist.

Muritha hermannsburgi, sp. n.

Body above very pale testaceous, more or less thickly punctured and mottled with black; head about as long as pronotum, elongate, gradually narrowing at apical area, the lateral lobes passing the central lobe, but not meeting beyond it, and forming two acute spines at the apex of the head; lateral margins sinuate, somewhat sparsely darkly punctate, the central basal area of the middle lobe impunctate; antennæ with the basal joint gradually thickened towards apex and slightly curved, a little shorter than the head but extending far beyond its apex, pale testaceous punctured with black, second joint about twice as long as first, moderately flattened and roundly ampliate for nearly its basal third, black, with a broad testaceous blackly punctate annulation before middle, third joint about one-third shorter than second, black with its base pale testaceous, remaining joint or joints mutilated in type; pronotum thickly blackly punctate, a distinct impunctate spot at middle of anterior area, lateral margins strongly concavely sinuate and shortly dentate, the posterior angles slightly produced with a short acute spine at their apices; scutellum a little shorter than breadth of pronotum at base, a little gibbous on basal area, after which it is distinctly transversely depressed, irregularly blackly punctate, centrally longitudinally, more or less distinctly impunctate; corium more or less thickly blackly punctate, with a short narrow oblique discal impunctate fascia; membrane testaceous, the veins reticulate and black; body beneath and legs paler than above, somewhat sparsely blackly punctate, two black fasciæ at middle of mesosternum; rostrum with its apex black and reaching apex of second abdominal segment, basal joint not passing base of head, second joint longer than the third and fourth joints together; abdomen finely centrally longitudinally sulcate for about its basal half; tibiæ a little more sparsely blackly punctate than the femora.

Long. 15¼ mm.; exp. pronot. angl. 8 mm.

Hab. Centr. Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

Genus Theseus.

Theseus, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 508.

Type, *T. modestus*, Stål.

Theseus lyricus.

Spudæus lyricus, Dist. Ann. & Mag. Nat. Hist. (7) iv. p. 424 (1899).

Hab. N.W. Australia.

Theseus turneri, sp. n.

♂. In structure and colour closely allied to *T. lyricus*, Dist., differing by the antennæ, which are brownish ochraceous, third joint piceous and distinctly shorter than second, not second and third joints almost subequal in length as in *T. lyricus*; scutellum longer, the apex more elongate, ochraceous and levigate; abdomen beneath with the sublateral black margins broader and the abdominal margins also irregularly black; male anal segment much produced beyond the apex of the abdomen, its lateral angles very prominent, with their outer margins longly pilose; pronotum darkly punctate, but without the two dark central fasciæ.

Long. 13 mm.; exp. pronot. angl. 6½ mm.

Hab. Queensland; Mackay (*R. E. Turner*, Brit. Mus.).

Theseus scutellatus, sp. n.

Stramineous, more or less thickly blackly punctate; head, anterior area of pronotum, basal area of scutellum, apical area of corium and connexivum ochraceous; body beneath and legs ochraceous; head beneath and a broad lateral fascia to sternum thickly darkly punctate; head with a sublateral pale line parallel with the insertion of the antennæ; prosternum with a black submarginal line, not reaching base; abdomen with a distinct sublateral fascia on each side, pitchy black; antennæ pale stramineous punctured with black, the third and fourth joints more darkly so, but with their bases impunctate, first joint moderately curved, considerably passing apex of head, second, third, and fourth joints almost subequal in length (fifth joint mutilated in specimen described); head as long as pronotum, the central lobe with two black converging lines on its posterior half, inner ocular and basal areas more or less impunctate; pronotum with a straight central longitudinal and a sublateral waved oblique line on each side, pale levigate, the lateral margins a little obscurely dentately sinuate behind eyes, posterior angles subangularly prominent; scutellum with the basal area a little raised and centrally longitudinally foveately impressed, posteriorly continued by two central raised levigate lines not reaching apex; corium with a maculate patch of black punctures near its apical margin; membrane hyaline with iridescent reflections; connexivum with a small black line and spot margining the incisures; rostrum reaching the apex of the second abdominal segment, first joint not extending behind the bucculæ, second and third joints subequal in length; legs stramineous, more or less punctured with piceous, anterior and intermediate tibiæ almost impunctate on basal areas, posterior legs mutilated in type.

Long. 12 mm.

Hab. Queensland; Townsville (*Dodd*, Brit. Mus.).

A species to be recognized by the structure of the scutellum, the sinuately subdentate anterior lateral margins of the pronotum, the pale hyaline membrane, &c. This species will doubtless by some systematists be considered entitled to subgeneric rank.

Genus AUSTROMALAYA.

Spudæus, Dall. List Hem. i. pp. 151 & 168 (1851) (nom. præocc.).
Austromalaya, Kirk, Entomologist, 1908, p. 124 (nom. nov.).

Type, *A. reticulata*, Westw.

Austromalaya souefi, sp. n.

Greenish ochraceous, irregularly, sometimes sparsely coarsely darkly punctate, apex of scutellum distinctly paler; corium considerably mottled with purplish, more especially on apical half; tegmina very pale fuliginous, with the veins darker; body beneath and legs very pale ochraceous; head beneath, lateral areas of prosternum, and acetabular regions of the mesosternum coarsely blackly punctate, some sublateral black punctures to the metasternum; apical areas of the femora blackly punctate, tibiæ ornamented with detached black lines arranged in pairs; antennæ with the first and second joints greenish ochraceous, streaked longitudinally with black, third joint black, greenish ochraceous at base, second and third joints subequal in length, first slightly passing apex of head, fourth and fifth joints mutilated in type; head sparingly punctate, more sparingly on basal area, two short central longitudinal series of black punctures on disk; pronotum sparingly coarsely darkly punctate, a somewhat large impunctate macular space behind anterior margin, lateral margins sinuate and shortly broadly dentate, posterior lateral angles shortly porrectly produced, their apical areas black; scutellum coarsely darkly punctate, more sparingly on basal area, and more finely and concolorously on apical area; corium somewhat sparingly punctate; connexivum with clusters of black punctures on most of the segments, their apical angles obtusely acute; abdomen beneath impunctate, spiracles black.

Long. 17½ mm.

Hab. N. Queensland; Cooktown (*D. Le Souef*, Brit. Mus.).

Allied to *A. parvula*, Westw., but larger, and differing in having the second and third joints of antennæ subequal in length, the impunctate macular space at anterior margin of pronotum, more strongly crenulate lateral pronotal margins, and the more produced posterior lateral angles, &c.

Genus EUMECOPUS.

Eumecopus, Dall. List Hem. i. pp. 151 & 172 (1851).

Type, *E. armatus*, Fabr.

Eumecopus armatus.

Cimex armatus, Fabr. Syst. Ent. p. 702 (1775).
Pœcilometis ruficornis, Walk. Cat. Het. i. p. 208. n. 11 (1867).
Pœcilometis calidus, Walk. loc. cit. n. 12.
Eumecopus armatus, Dist. Ann. & Mag. Nat. Hist. (7) iv. p. 425 (1899).
Eumecopus callidus, Van Duz. Bull. Ann. Mus. xxi. p. 195 (1905); Kirk. Cat. Hem. (Heterop.) i. p. 189 (1909).

Van Duzee has treated *calidus*, Walk., as a distinct species, in which he has been copied by Kirkaldy. Van Duzee writes:—"This species is easily distinguished by its bright reddish tint, the broad blackish submargins and median line of the pronotum, the dark scutellum with imperfect median line and the large pale cali in the angles, and the conspicuous black ray on the disk of the elytra." These, however, are not the characters found in Walker's type, and are more characteristic of typical *armatus*. In *calidus* the black median fascia and submargin to the pronotum are much narrower, not broader; the callose basal spots to scutellum vary in size in different specimens, in some the broad black median band to the pronotum is continued through the scutellum.

The *calidus*, Walk., is only a varietal form of a variable species.

Eumecopus alexandrianus, sp. n.

Head purplish brown, three longitudinal fasciæ at base extending to a little before eyes, and in front of these the margins of the central lobe, basal halves of lateral margins in front of eyes, basal margins of eyes, and a basal spot before eyes ochraceous, lateral lobes a little transversely wrinkled and punctate, their outer margins sinuate and slightly recurved; antennæ reddish testaceous, apices of second and fifth joints and base of fourth ochraceous, second joint subequal in length to third, first longly passing apex of head, slightly thickened and curved, fourth slightly longer than third, distinctly longer than fifth; pronotum purplish brown, very coarsely punctate and irrorate with ochraceous markings, the anterior and lateral areas more finely punctate, lateral margins strongly concavely sinuate, obscurely crenulate near apices, posterior angles strongly spinously produced, a little upwardly recurved; scutellum dark purplish brown, irrorated with ochraceous, slightly rugulose, coarsely thickly punctate, a levigate spot at each basal angle, a smaller central basal spot and the apex broadly ochraceous; corium purplish brown, thickly and more finely punctate, irregularly irrorate with ochraceous, the lateral and apical margins and the inner margin of the costal area ochraceous; membrane blackish; connexivum purplish brown, punctate, its outer margin ochraceous; body beneath ochraceous, with a large apical black spot occupying nearly all the sixth and anal segments; legs purplish, streaked with ochraceous; rostrum reaching the base of the second abdominal segment.

Long. 21 to 23 mm.; exp. pronot. angl. 10½ to 11 mm.

Hab. N. Australia; Alexandria (*W. Stalker*, Brit. Mus.).

Allied to *E. abdominalis*, Dist., but differing by the second joint of antennæ subequal in length to third joint, not half its length as in *abdominalis*, more produced pronotal spines, distinct colour of abdomen beneath, &c.

Eumecopus eyrei, sp. n.

Above ochraceous, thickly punctured and mottled with black; head with six longitudinal black fasciæ, two central and two on each lateral area, extreme lateral margins between antennæ and eyes also black, the black fasciæ prominently punctate; antennæ black or fuscous, bases of third and fourth joints ochraceous, basal joint shorter than head but projecting beyond it, second joint minute, about one-third the length of first, third longest, one-third longer than fourth (remainder mutilated in type); pronotum with two small but distinct pale spots on disk of anterior area, the lateral angles produced into somewhat long slender distinct spines, the apices of which are very slightly recurved, lateral margins concavely sinuate, their apices obscurely crenulate; scutellum much suffused with blackish, especially on basal third and before apex, somewhat rugulose on basal area, three small spots on basal margin—one central and one near each basal angle—and the apex ochraceous, levigate; corium less blackly punctate except on inner posterior area, where there is a distinct pale levigate spot, membrane black, distinctly passing abdominal apex; body beneath pale ochraceous; sternum somewhat thickly darkly punctate, two black spots near anterior acetabula and a larger black spot near intermediate acetabula; abdomen widely thickly brownly punctate between the spiracles and the central disk, the latter only very sparsely brownly punctate, the spiracles forming the centre of somewhat large shining black spots, the lateral margins at apices of segmental margins spotted with black, and a large central subapical black spot on disk; legs ochraceous, spotted and streaked with castaneous, apical areas of tibiæ castaneous; rostrum passing the posterior coxæ, its apex black; abdomen with the central sulcation only prominent on basal area.

Long. 18 mm.; exp. pronot. angl. 8½ mm.

Hab. S. Centr. Australia; 100 miles E. of Lake Eyre (*H. J. Hillier*, Brit. Mus.).

Allied to *E. vittiventris*, Stål, from which it differs by its much more slender form and the minute second joint of the antennæ.

Eumecopus confusus, sp. n.

Ochraceous, thickly mottled and punctured with black; head black, with three basal longitudinal fasciæ, the two outermost of which are narrowly continued towards apex, a fascia margining each side of central lobe, basal halves of lateral margins, basal margins of eyes, and a spot behind them ochraceous, most of the punctures arranged longitudinally; antennæ with the first and second joints castaneous, third, fourth, and fifth black, with their bases ochraceous, extreme apices of second and third ochraceous, second joint distinctly longer than third, fourth longest; pronotum coarsely punctate and subrugulose, lateral margins moderately concavely sinuate, their apices very obscurely crenulate, the posterior angles moderately subspinously produced; scutellum blackly punctate, more confluently so on basal and apical areas, three basal spots and the apex ochraceous, levigate; corium irregularly blackly punctate, the punctures in somewhat longitudinal series on inner and outer margins of costal area and a little confluently on posterior disk; membrane bronzy-brown; connexivum black, thickly punctate, with its lateral margin ochraceous; head beneath ochraceous, with two longitudinal black lines on each side; sternum ochraceous, mottled and punctured with black; abdomen beneath black, the segmental margins and a central broken macular fascia ochraceous, lateral margins uniformly narrowly greenish ochraceous; legs blackish mottled with ochraceous, posterior tibiæ with a broad ochraceous annulation.

Long. 24 mm.; exp. pronot. angl. 13 mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

Allied to *E. conspersus*, Walk., from which it differs by the second joint of the antennæ being longer than the third, not half the length of the third as in Walker's species; also by the pale marginal border, not marginal spots, to the abdomen beneath; antenniferous tubercles outwardly obtusely spinous in *conspersus*, not so in *confusus*.

Eumecopus moseleyi, sp. n.

Reddish brown, blackly punctate; head, anterior and lateral areas of pronotum, subapical area of scutellum, and base of lateral margin to corium blackish or blackly punctate; head with a central longitudinal line, a short longitudinal line on each side of it at basal area, margins of central lobe, extreme lateral margins, basal margins of eyes, and a basal spot beneath them ochraceous, lateral margins strongly concavely sinuate and distinctly reflexed; antennæ with the first joint black, second reddish, third black, with its basal third reddish, second joint distinctly shorter than third, first longly passing apex of head, moderately thickened and slightly curved (remaining joints mutilated in type); pronotum thickly blackly punctate, the black anterior area with a few pale speckles, lateral margins only moderately sinuate but distinctly reflexed, extreme lateral and basal edges ochraceous, posterior angles moderately prominent and shortly spinous; scutellum with a spot near each basal angle and the apex ochraceous; corium thickly punctate, extreme lateral margin ochraceous; membrane blackish; abdomen above and connexivum black, extreme edge of the latter ochraceous; body beneath ochraceous, blackly speckled or punctate, extreme margins of head, prosternum, and abdomen pale ochraceous, inwardly margined by a black sublateral fascia; a curved line on each side of prosternum, two central elongate spots to mesosternum, and basal segmental margins (narrowly) black, apical segmental margins (narrowly) ochraceous; legs reddish ochraceous, apical areas of femora blackish; rostrum passing the posterior coxæ, its apex black.

Long. 19 mm.; exp. pronot. angl. 11½ mm.

Hab. Queensland * ('Challenger' Exp., Brit. Mus.).

Allied to *E. apicalis*, Westw., but with the lateral margins of the pronotum more strongly sinuate, body broader, different colour of abdomen beneath, &c.

Genus PŒCILOMETIS.

Pœcilometis, Dall. List Hem. i. pp. 151 & 170 (1851).

Type, *P. strigatus*, Westw.

Pœcilometis borealis, sp. n.

Ochraceous, thickly darkly brownly punctate; head with

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* This species was probably taken during the 'Challenger's' visit to Cape York.

the lateral margins (more broadly posteriorly) pale, impunctate; antennæ reddish testaceous, apical joint (excluding base) more or less fuscous, basal joint stoutest, slightly curved, shorter than head but projecting beyond it, second joint subequal in length to first and third, fourth a little longest, distinctly longer than fifth; pronotum with the anterior margin narrowly and the lateral margins more broadly pale ochraceous, the latter moderately concavely sinuate, the posterior angles subprominent; scutellum very narrowly and irregularly margined with pale ochraceous at base, a spot near each basal angle and the apex pale ochraceous; corium with the veins and narrow external margin pale ochraceous, the lateral margins distinctly rounded; membrane black, with paler longitudinal streaks; abdomen above reddish ochraceous, apical area fuscous, connexivum ochraceous and excluding its extreme margin thickly brownly punctate; body beneath stramineous, sternum (excluding central disk and lateral margins) and abdomen (excluding extreme lateral margins) thickly finely darkly punctate, sublateral margins of head between antennæ and eyes, and apical half of sublateral margins to prosternum, black; legs ochraceous, finely darkly punctate; rostrum reaching the fourth abdominal segment, its apical joint piceous; central abdominal sulcation profound and reaching the base of the last abdominal segment.

Long. 16 mm.; exp. pronot. angl. 7½ mm.

Hab. N. Australia; Alexandria (*W. Stalker*, Brit. Mus.).

Allied to *P. stigmatus*, Van Duz., by the rufescent antennæ, but differing in the second joint of the antennæ being subequal in length to first, not more than twice its length, nor "brevissimo" as in *P. fasciatus*, Stål.

BATHRUS.

Bathrus, Dall. List Hem. i. pp. 151 & 169.

Type, *B. variegatus*, Dall.

This genus requires amplification in its generic characters so far as the neuration of the membrane is concerned. Dallas, in his "Table of Genera," distinguished *Bathrus* by having "membrane with three nervures," but in fully describing the genus subsequently he wrote "membrane with an oblong basal cell and four longitudinal nervures, of which the two outer are furcate." In the species I now describe, none of the nervures are furcate.

Bathrus dissimilis, sp. n.

Above greenish testaceous, irregularly punctured with black; head with the punctures near the lateral margins, the central lobe (excluding apex), and a curved linear punctate fascia before eyes resplendent green; antennæ four-jointed, with the first joint stramineous, outwardly black, second black, third and fourth black, with their bases broadly ochraceous, basal joint projecting beyond the apex of head, second longer than third and nearly three times as long as the first, third and fourth subequal in length; pronotum considerably mottled with bright green, especially near the anterior margin, and on the disk forming very obscure, irregular, oblique fasciæ, lateral margins oblique, with their anterior halves strongly dentate; scutellum strongly mottled with bright green on basal half, which is also strongly rugulose, the rugulosities and the apex pale, levigate, a foveate bright spot at each basal angle; corium much more finely punctate, more prominently green near basal and apical areas; membrane bronzy-brown; connexivum pale ochraceous, with large green segmental spots; body beneath and legs pale ochraceous, shining, impunctate, a bright green curved line on each side of the prosternum and a short linear spot of the same colour on each side of the mesosternum; abdominal spiracles black; rostrum passing the second abdominal segment, its apex black; ventral sulcation very pronounced and reaching the apex of the fifth segment; tibiæ biannulated with fuscous.

Long. 16 mm.; exp. pronot. angl. 7½ mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

In colour and markings very closely allied to *B. variegatus*, Dall., but with the lateral margins of the pronotum oblique, not sinuate, and the longitudinal nervures of the membrane not furcate.

Genus Accarana.

Accarana, Dist. Tr. Ent. Soc. Lond. 1888, p. 478.

Type, *A. metallica*, Dist.

Accarana australica, sp. n.

Ochraceous, coarsely, thickly, darkly punctate; head about as long as broad, coarsely thickly punctate excepting a basal area between eyes, which (excluding the margins and central longitudinal lines of punctures) is impunctate, central lobe slightly projecting beyond the lateral lobes, rounded in front; antennæ brownish ochraceous, basal joint with longitudinal black lines, shorter than head but projecting beyond it, second joint slightly shorter than third, fourth and fifth longest, subequal in length; pronotum thickly coarsely punctate, posterior angles distinctly prominent, obtusely acute, anterior angles shortly spinous, margins of the transverse cicatrices impunctate; scutellum thickly coarsely punctate, a series of small pale obscure spots on basal margin, a small bronzy-green spot at each basal angle, apex slightly extending over base of membrane; corium thickly and rather more finely punctate; membrane subhyaline, the veins prominent, extending beyond abdominal apex; connexivum with the posterior angles of the segments distinctly spinous; body beneath and legs ochraceous, the latter spotted with castaneous; central metasternal ridges and basal ridges of the abdominal sulcation castaneous; apex of rostrum mutilated in type, ventral furrow long, almost extending to base of apical abdominal segment.

Long. 12 mm.; exp. pronot. angl. 6½ mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

The first species of this Papuan genus yet described from the Australian continent.

Genus ECTENUS.

Ectenus, Dall. List Hem. i. pp. 151 & 173.

Type, *E. spectabilis*, Burm.

Ectenus elongatus, sp. n.

Reddish testaceous or ochraceous, more or less punctate with bronzy green; head elongate, distinctly longer than broad including eyes, somewhat thickly punctate, lateral margins strongly concavely sinuate a little before middle, apex narrowed, the central projecting moderately before the lateral lobes; antennæ long and slender, first and second joints castaneous brown, third, fourth, and fifth joints black, apex of second, basal half of third, and bases of fourth and fifth joints ochraceous, basal joint stoutest, shorter than head but extending beyond its apex, second a little shorter than third, fourth, or fifth, which are subequal in length; pronotum coarsely punctate, the punctures mostly bronzy green, which also form four more or less distinct fasciæ, two lateral and two central, posterior angles subprominent, lateral margins sinuate; scutellum thickly punctate, much suffused with bronzy green, apex pale ochraceous and impunctate, a small obscure curved elongate spot of the same colour at each basal angle; corium more sparsely punctate, a distinct bronzy green patch on posterior disk; membrane longly projecting beyond the abdominal apex, blackish, the apical area paler; body beneath and legs ochraceous; sublateral margins of sternum punctate, bright bronzy green, lateral and sublateral margins of head beneath, two oblique central fasciæ to mesosternum, a sublateral abdominal fascia, and a spot on the apical segment black or dark bronzy green; legs ochraceous, more or less clouded with piceous, especially on apical areas of tibiæ and femora.

Long. 19–21 mm.; exp. pronot. angl. 7½ mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

This species varies in the ground-colour of the upper surface, especially of the corium, which is either reddish testaceous or ochraceous. It is the first species of the genus recorded from the Australian continent.

MUNDUALA, gen. nov.

Body moderately short and broad; head about as long as breadth at base including eyes, central lobe broadest at apex and slightly projecting beyond the lateral lobes, lateral margins strongly sinuate; antenniferous tubercles outwardly distinctly spined, the spine inwardly curved; antennæ with five joints, first joint much shorter than head and scarcely passing its apex, first and second subequal in length, third shortest, fourth longest, slightly longer than fifth; pronotum about half as long as breadth between posterior angles, the lateral margins distinctly reflexed, more broadly so behind eyes, where there is a distinct obtuse spine, anterior margin subconcavely excavated behind eyes, which are large but do not reach the anterior pronotal angles, posterior pronotal angles subprominent, obtusely angulate, posterior margin before scutellum truncate; scutellum longer than broad at base, the basal area somewhat elevated, lateral margins oblique, the apex distinctly narrowed; corium about as long as scutellum and pronotum together, the apical angle distinctly subangularly produced; membrane slightly passing abdominal apex, the veins numerous and longitudinal; rostrum reaching the fourth abdominal segment, first joint extending to base of head, second and third joints subequal in length, each longer than fourth; abdomen beneath strongly centrally longitudinally sulcate from base to apex of penultimate segment; femora moderately thickened, posterior legs with the femora and tibiæ equal in length, tarsi with the basal joint as long as the remaining joints together.

The salient characters of this genus are the strongly spined antenniferous tubercles, the reflexed lateral margins of the pronotum and the spined anterior angles of same, and the subangularly produced apical angles of the corium.

Munduala typica, sp. n.

Above reddish testaceous, thickly darkly punctate; head coarsely punctate, at inner margins of eyes ochraceous, levigate; eyes black; antennæ with the basal joint ochraceous mottled with testaceous, second and third joints brownish, fourth and fifth piceous, base of fourth and basal half of fifth ochraceous; pronotum somewhat thickly coarsely punctate; scutellum coarsely punctate, subrugulose on basal area, a reddish curved levigate spot at each basal angle, and the apex pale ochraceous; corium thickly and rather more finely punctate, the interior area more darkly shaded; membrane bronzy brown; head beneath and sternum ochraceous, the first finely and sparsely punctate, the second strongly and distinctly punctate; abdomen beneath very pale ochraceous, finely, sparsely, testaceously punctate, the spiracles and three central longitudinal spots on apical segment black; legs ochraceous, femora finely spotted with castaneous; other structural characters as in generic diagnosis.

Long. 16 mm.; exp. pronot. angl. 8 mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

Genus TINGANINA.

Tinganina, Bergr. Deutsch. ent. Zeitschr. 1909, p. 328.

Type, *T. dimorpha*, Bergr.

Bergroth writes:—"Tinganina hiess die letzte überlebende von den ausgestorbenen Ureinwohnern Tasmaniens. Sie starb 1876." This unfortunate woman's name is usually spelled Truganini. The remark is necessary, because the generic name may *unnecessarily* be emended by some future writer. The British Museum also possesses a specimen from Launceston in Tasmania.

TURRUBULANA, gen. nov.

Body moderately flattened and compressed, above thickly coarsely punctate; head much longer than broad, deeply inserted in the pronotum, gradually attenuated towards apex, the lateral margins bisinuate, the lateral lobes a little longer than the central lobe but not converging beyond it; eyes prominent, touching the anterior pronotal angles; antennæ five-jointed, first joint short, not nearly reaching apex of head and scarcely seen above, second and third subequal in length, each shorter than fourth or fifth, which are also subequal in length; pronotum about twice as broad at base as median length, anterior margin very strongly concavely excavated for the reception of the head, the lateral margins roundly oblique and sinuate, anteriorly very obscurely dentate, posterior angles subprominent, anterior angles obtusely subspinous, basal margin before scutellum truncate; scutellum about as long as broad at base, lateral margins oblique for about two-thirds from base, thence narrowed to apex; corium about as long as head and pronotum together; membrane slightly passing abdominal apex, with longitudinal veins, some of the innermost furcate; connexivum exposed from before middle of corium; rostrum extending to the fourth abdominal segment, basal joint not quite reaching base of head, second extending to the posterior coxæ, about equal in length to third and fourth together; abdomen beneath centrally longitudinally sulcate from base to near apex; legs somewhat short and robust, posterior tibiæ not longer than posterior femora.

A genus to be recognized by the compressed or flattened body and the deeply concavely excavate anterior pronotal margin; it may be placed near *Atelocera*.

Turrubulana plana, sp. n.

Brownish ochraceous, thickly, coarsely, darkly punctate; central lobe (excluding apex), lateral margins of pronotum, base of lateral margin to corium, a large levigate spot near each basal angle of scutellum and the apex of same, and a small spot on posterior disk of corium pale ochraceous; connexivum pale ochraceous, inwardly castaneous brown, the latter colour narrowly reaches margin along the segmental incisures; antennæ black, first joint and extreme apex of fifth joint reddish brown; body beneath thickly darkly punctate, but a little paler than above, lateral abdominal margin as connexivum above; rostrum and legs brownish ochraceous, apex of rostrum black, apices of femora distinctly broadly castaneous; membrane black, the apex paler.

Long. 10½ mm.; exp. pronot. angl. 5½ mm.

Hab. S. Centr. Australia; 100 miles E. of L. Eyre (*H. J. Hillier*, Brit. Mus.).

[To be continued.]

XLII.—*Hornless Okapies.* By W. G. Ridewood.

In the August number of the 'Annals and Magazine of Natural History,' pp. 224–226, Mr. R. Lydekker endeavours to show that hornless specimens of the Okapi are larger than those with horns. Without venturing to express an opinion one way or the other upon the question, I would point out that the validity of the conclusions arrived at is weakened by two incorrect statements which have a material bearing upon the argument.

On p. 225 the skull of the stuffed Okapi presented to the British Museum by Major Powell-Cotton is stated to be 339 mm. in length. It is not mentioned how this measurement is taken, whether to the front of the nasals or to the front of the premaxillæ, or otherwise. But at the foot of the page the lengths of two other skulls are given, namely, 375 mm. as the length of a skull presented to the British Museum by Sir Harry Johnston, and 377 mm. as the length of a horned skull in the Tervueren Museum. These measurements are quoted from Sir E. Ray Lankester's paper (Trans. Zool. Soc. xvi. 6, 1902, p. 305), where the length is stated to have been taken to the front of the nasal bones. One concludes, therefore, that, since a comparison is being instituted between these three skulls, the length of the skull of Major Powell-Cotton's specimen is measured to the front of the nasals. The length as measured in this manner is 390 mm., not 339 mm. The skull is thus *longer* than the skull of Sir Harry Johnston's specimen; in other words, the horned skull is longer than the hornless one.

On p. 226 Mr. Lydekker writes concerning the Tervueren skull above mentioned:—"I am informed by the Director of the Tervueren Museum that the mounted skin of the specimen to which the skull pertained is 145·5 cm. in height." The skull in question is that of the skeleton numbered 480 in the late Monsieur J. Fraipont's monograph ('Annales du Musée du Congo,' Zool. sér. 2, vol. i., *Okapia*, 1907). According to the list of specimens on page 14 of that work, and according to the earlier statements by Dr. C. I. Forsyth Major in the 'Proceedings of the Zoological Society,' 1902, ii. pp. 73 & 77, and 'La Belgique Coloniale,' Ann. viii. 45, Nov. 9th, 1902, p. 533, the skin corresponding with that skeleton was not sent to Europe; the skin which arrived at the same time as the skeleton (namely, skin no. 479, now in the Stockholm Museum) was from another and a younger animal. In answer to an inquiry the Director of the Tervueren Museum has been good enough to send me an extract from his letter to Mr. Lydekker, to the effect that in the Tervueren Museum there are two horned Okapis—a stuffed skin standing 145·5 cm. at the shoulder, and a mounted skeleton of another individual. That Mr. Lydekker should speak of "the mounted skin of the specimen to which the skull pertained" is calculated to lead to confusion in the future.

Returning to the main thesis, that hornless Okapis are larger than horned ones, it may be noted that the two skulls figured by Dr. C. I. Forsyth Major (Proc. Zool. Soc. 1902, ii. pp. 342 & 343) and by Monsieur J. Fraipont ('Annales du Musée du Congo,' Zool. sér. 2, vol. i., *Okapia*, 1907, plates iii. & v.) are of the same age, both being fairly old, but the horned skull is the larger of the two. And again, the cast of the horned skull purchased of Mr. Rowland Ward by the British Museum (B.M. reg. no. 7. 12. 25. 2) is in most measurements larger than the skull presented by Sir Harry Johnston (B.M. reg. no. 1. 8. 9. 51). It is true that the former is an older skull than the latter, but the comparison weakens the generalization that the hornless are larger than the horned animals.

As regards the connexion between horns and sex referred to by Mr. Lydekker, it is remarkable how little is definitely known, for the natives invariably cut away the genitals when skinning the animal; and an unbiassed investigation of the subject is made more difficult than it need be by taxidermists skilfully adding male external genitals when stuffing skins which have horns, and which they are convinced must therefore be of male sex. The relation between horns and sex is dealt with in Sir E. Ray Lankester's forthcoming "Atlas" ('Monograph of the Okapi,' Atlas, London, 1910).

XLIII.—*A List of the Mammals obtained by Mr. R. B. Woosnam during the Expedition to Lake Ngami, with Field-Notes by the Collector.* By Guy Dollman.

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The following is a list of the mammals collected by Mr. R. B. Woosnam during the recent expedition to Lake Ngami. The collection was chiefly made at Lake Ngami and Lehutitung in the Kalahari Desert, a certain proportion of the specimens being obtained further south on the Molopo River. The collection is one of great value, as the Ngamiland mammalian fauna has hitherto only been represented by the collection made by Andersson over fifty years ago, the majority of the specimens of which are now so faded and discoloured that they are almost useless for comparative systematic work.

One striking feature about the skins of the Ngami and Kalahari specimens is the remarkable uniformity exhibited in the coloration of the several species, in nearly every case a pale sandy tint predominating. As regards the novelties, the large grey dormouse is the most distinctive, and in such a monotonously coloured genus as *Graphiurus*, this Ngamiland species, in so far as its colour is concerned, stands quite by itself. It has been found necessary to give subspecific names to four new forms, all of them representing desert races of South-African species.

Mr. Woosnam's notes on the Ngamiland district are as follows:—

"There are two routes to Ngamiland in British territory which have been used by traders for the last fifty years—one from Palapye Road Station *viâ* Serowe (Khama's capital), and thence North and N.E. across the desert to the nearest point of the Botletle River, and so up the river to the Lake. This is Livingstone's route and the best-known one. The other, from Mafeking or Vryburg, goes W. *viâ* Kakia to Lehutitung, and thence N. past Okwa and Ghansis to the Lake. This route is practically never used now, and when we travelled by it in 1909 no waggon had been along the track for six years, and the track was almost entirely obliterated between Lehutitung and Ghansis. We chose the latter route, as it passes through the middle of the desert, and some of the mammals in the present collection were obtained at various places along the road during the journey through the Kalahari to Ngamiland.

"The physical geography of the Kalahari Desert and Ngamiland may briefly be said to consist of a great shallow central basin or valley surrounded by a rim of higher country, and there is only one outlet to the sea, namely towards the Orange River. The lowest point of the whole central and northern Kalahari basin is the great Makarikari salt-pan, and from observations of altitudes during our journey I am inclined to believe that there is a low broad ridge running across the Kalahari somewhere about 23° S., and forming a low watershed between the Okovango and Nosop Molopo river-systems. The watershed between the Okovango and Zambesi systems is a low and very ill-defined one, and it is doubtful whether during the times of highest flood the Okovango marshes are not connected with those of the Chobe and Zambesi.

"At the present day the importance and capacity of Lake Ngami is infinitesimal when compared with the huge extent of the Okovango marshes and periodically flooded area to the N. and N.E. of the lake; and it is important to realize that the origin and only source of all the intricate maze of streams and marshes of Ngamiland is the great Okovango River, which rises in the Mosamba Mountains in Portuguese W. Africa and drains an enormous area with a very heavy rainfall from October to March. The result of this is a huge periodical flood which flows down the Okovango into the marshes of Ngamiland. These gradually rise and overspread hundreds of square miles of the surrounding country, which is extraordinarily flat, the inundation reaching its highest point *not* during the rainy season, but towards the end of the dry season, about August or September. None of this enormous volume of water finds its way out to the sea, but after filling the marshes N. of the lake, and formerly the lake itself, flows on down the Botletle or Zonga, and is at length lost by evaporation and percolation. No doubt formerly on many occasions some of this flood has reached the great Makarikari salt-pan which is the Ngamiland basin, but apparently no flood has been large enough to reach the Makarikari for many years, although an old dry river-bed can be traced. Now there is no doubt that it is only comparatively quite recently that the water-supply of Lake Ngami has failed and the lake partially dried up; for although the processes which brought about this result must have been in progress long before Livingstone's visit in 1849, his description of the lake and illustration clearly show it to have been then an imposing sheet of water to a great extent open. To-day Lake Ngami is just a great reed-bed, which dries up almost entirely by the beginning of the periodical flood.

"The explanation of this failure of the water-supply of the lake is to be found in the fact that previously one of the many large channels of the Okovango River called the Téonghé ran into the lake at the N.W. corner, but by a natural process of reed-growth and silting up this channel has gradually become choked, till now no water at all finds its way into the lake from the N.W., and its only source of supply is at the S.E. corner, where it is connected with the Botletle by a kind of backwater or arm, through which it receives a certain amount of water when the floods have risen sufficiently high in the Botletle for water to run back along this channel; but the lake never fills to anything like its former level now.

"The whole Kalahari and Ngamiland is a vast undulating grassy plain covered almost all over with dense kameelthorn forest or lower scrubby 'hock dorn' bush, with a few stretches of open grass-country, chiefly in the neighbourhood of the W. of Mafeking. This dry 'bush veldt' extends right up to and around the edges of the Okovango marshes, and the soil is everywhere very sandy. In Ngamiland the vegetation is less thorny, and many large-leafed semitropical trees appear. Palm-trees grow luxuriantly throughout the marshes, which are studded with numerous large and beautiful islands, which are quite as tropical in appearance as anything in Uganda or the Congo. N. and N.E. of the Okovango marshes there are large tracts of dry mopani forest, which extend, I believe, up to the Zambesi.

"A most noticeable feature of the Kalahari is the great number of shallow and perfectly flat pans, usually covered when dry with a deposit of salt and nitrate of soda; and although these pans are dry during the greater part of the year, sometimes for several years, animal life of all kinds is generally more abundant in their neighbourhood."

1. *Galago moholi*, Smith.

♂. 51, 57; ♀. 56. Lake Ngami.

"These little lemurs were quite common in Ngamiland and along the Botletle River where there was any dense vegetation and large-leafed tropical trees. They do not appear until a few minutes after sunset."

2. *Petalia thebaica*, Geoff.

♂. Lake Ngami.

3. *Vespertilio capensis*, Smith.

♂. 29. Okwa, Kalahari.

♂ (preserved in spirit). Lehutitung, Kalahari.

"This bat was seen at all the water-holes in the Kalahari. They were flying up and down the large spruit at Okwa in the evenings in hundreds hawking insects."

4. *Pipistrellus nanus*, Pet.

♂. 55. Lake Ngami.

"A few of these bats were seen in Ngamiland, but they were not common. It was the winter season at the time of our visit."

5. *Crocidura bicolor*, Boc.

♂ (preserved in spirit). Lake Ngami.

"When crossing one of the many branches of the Okovango River in Ngamiland the waggon was partly submerged, and this small shrew was found climbing up the tent of the waggon to escape the water in company with a specimen of *Leggada bella induta*."

6. *Crocidura deserti*, Schwann.

♂. 28, 33, 34, 35, 36; ♀. 30, 31, 32. Okwa, Kalahari.

♂. 61. Mababe Flats, S. Africa.

"All the specimens of this shrew from Okwa were caught at the bottoms of old dry native wells in the bed of the spruit, where they seemed to be very plentiful. No. 61 was caught some 400 miles further north in totally different country in the marshes on the E. side of the Okovango marshes, so that the two localities are separated by a vast extent of marshes and rivers."

7. *Mungos gracilis badius*, Smith.

♂. 39. Lake Ngami.

"This mungoose was shot high up in a tree among the creepers around the trunk, where it was probably looking for birds' nests."

8. *Crossarchus fasciatus*, Desm.

♀. 60, 62. East bank of Tamalakan River, 100 miles N.E. of Lake Ngami.

"These two were caught by a dog out of a party of five or six in the dry mopani forest on the east side of the Okovango marshes. We did not meet with them in the Kalahari Desert."

9. *Paraxerus cepapi*, Smith.

♂. 76; ♀. 53. Lake Ngami.

"No squirrels were seen in the Kalahari, but in Ngamiland they were very common among the larger trees and more tropical vegetation."

10. *Graphiurus woosnami*, sp. n.

♂. 38. North of Okwa, Kalahari.
♀. 1. Molopo River.

A large pale grey-coloured species allied to *G. angolensis*, de Wint.

Size and general proportions about as in *G. angolensis*. Hair of medium length, similar to that of *G. murinus*. General colour of upper surface pale ashy grey (between ashy grey no. 2 and grey-no. 1, 'Repertoire de Couleurs'), rather paler on the flanks and face. Individual hairs of back with dark slate-grey bases; apical portions dingy white, the extreme tips brownish. Sides of face, below eyes to ears, white; hairs with dark grey bases and white tips. Eyes surrounded with dark-coloured rings. Area in front of eyes, at base of whiskers, inclined to be rather dark, but not markedly so. Backs of hands and feet white. Entire underparts greyish white, slightly tinged with buff. Hairs of belly all with grey bases and light-coloured tips. Hairs on chin and lower lip entirely white. Tail long and bushy, but not to such a marked extent as in *G. angolensis*. Upper surface of tail pale greyish white, hairs with brownish-grey bases and long white tips. Extreme tip of tail pure white. Underside of tail rather lighter in colour than upper surface.

Skull about the same size as that of *G. angolensis*, with a rather flatter brain-case and less inflated auditory bullæ.

Dimensions of the type (measured in the flesh):—

Head and body 100 mm.; tail 86; hind foot 18; ear 17·5.

Skull: greatest length 29·3; basal length 24·5; condylobasal length 27·2; basilar length 22·5; condylo-basilar length 24·8; zygomatic breadth 17; breadth of brain-case across squamosal region 12·7; breadth of brain-case across occipital region 12; nasals, greatest length 11·2, greatest breadth 3·4, least breadth 1·7; palatal length 12; palatilar length 9·8; width of palate inside m^1 3·7; width of palate outside m^1 6·3; length of palatal foramina 3·6; length of upper cheek-teeth 3·4.

Hab. North of Okwa, Kalahari. Altitude 3000 feet.

Type. Adult male. B.M. no. 10. 6. 3. 20. Original number 38. Collected June 13th, 1909.

This handsome dormouse, so strikingly different from all the other members of the genus, appears to be a desert species allied to the Angolan form, *G. angolensis*, from which it is at once distinguished by the pale greyish-white colour of the dorsal surface.

"The type specimen was caught at Okwa, which is about halfway between the Molopo River and Lake Ngami, right in the middle of the Kalahari. It ran out of a big log which had been thrown on the fire at night, and I fortunately managed to catch it as it passed me."

11. *Tatera lobengulæ griquæ*, Wrought.

♂. 44, 52; ♀. 43, 54. Lake Ngami.
♀. 6. Molopo River.
♂. 68. Mababe Flats, Ngamiland.

"In Ngamiland there is a periodical flood which occurs in the *dry season*, and besides filling up the vast Okovango marshes and Lake Ngami inundates hundreds of square miles of dry sandy country and acacia-forest. As the water advances over the flat country the small mammals are driven back, and towards the height of the flood in many places around the marshes the whole surface of the ground for miles is covered all over with mouse-holes, where the fugitives take up temporary residence until the floods subside. The natives assured me that lions sometimes hunt the mice in these colonies and dig them out and eat them, as they are then very fat, it being winter."

12. *Tatera brantsi perpallida*, subsp. n.

♂. 24, 25; ♀. 23. Lehutitung, Kalahari.
♀. 64. East bank of the Tamalakan River, Ngamiland.
♀. 69. Mababe Flats, Ngamiland.

Closely related to *Tatera brantsi*, Smith, but rather smaller and very much paler in colour.

Size and general proportions rather less than in *T. brantsi*. General colour of upper surface of body pale straw-yellow, washed over with a brownish tint (between pale ecru no. 3 and snuff-brown no. 1, 'Repertoire de Couleurs'); flanks rather paler (pale yellowish flesh no. 3, 'Repertoire'). Head and nasal region a little darker than rest of dorsal surface. Individual hairs of back with slaty grey bases; apical portions pale yellowish buff, extreme tips brownish. Backs of hands and feet white. Entire underparts white. Tail clothed with rather short hairs, upper surface with a median pale brownish stripe extending along the basal two-thirds of its length; apical third white. Underside of tail entirely white.

Skull very similar to that of *T. brantsi*, with rather larger auditory bullæ and shorter palatal foramina.

Dimensions of the type (measured in the flesh):—

Head and body 135 mm.; tail 152; hind foot 32; ear 24·5.

Skull: greatest length 40; basal length 34·2; condylobasal length 36; basilar length 31; zygomatic breadth 21·4; breadth of brain-case across squamosal region 16·3; interorbital breadth 6·2; nasals, greatest length 16·9, greatest breadth 4, least breadth 2·8; palatal length 21·2; palatilar length 18; width of palate inside m^1 3·9; width of palate outside m^1 9; length of palatal foramina 7; post-palatal length 13·4; length of upper cheek-teeth 6·7.

Hab. East bank of the Tamalakan River, Ngamiland. Altitude 3700 feet.

Type. Adult female. B.M. no. 10. 6. 3. 25. Original number 64. Collected July 26th, 1909.

The very much lighter colour of the pelage indicates that this Gerbil must be regarded as distinct from the South African *T. brantsi.* It would appear to be a desert form of that species, and as such deserving of subspecific rank.

"I noticed nothing in the habits of this Gerbil to differentiate it from the other species."

13. *Desmodillus auricularis pudicus*, subsp. n.

♀. 27; ♀ (in spirit). Lehutitung, Kalahari.

A buff-coloured race of *Desmodillus auricularis*, Smith.

Size and proportions as in *D. auricularis.* General colour of dorsal surface yellowish sandy red (between dark fawn no. 1 and buff no. 1, 'Repertoire de Couleurs'). Flanks rather purer and brighter in colour (buff no. 1, 'Repertoire'). Individual hairs of back with slate-grey bases and light, yellowish-buff tips, some of the hairs, down the middle of the back, with the extreme tips dark brown. Face between eyes and nasal region similar in colour to flanks. Cheeks pale yellowish red, becoming pure white on the upper lip and sides of neck. White patches behind ears as in *D. auricularis.* Backs of hands and feet covered with short white hairs. Entire underparts white; hairs on belly white throughout. Tail yellowish red above, paler and whiter towards the tip; under surface white.

Skull as in *D. auricularis.*

Dimensions of the type (measured in the flesh):—

Head and body 108 mm.; tail 92; hind foot 24; ear 13·5.

Skull: greatest length 37; basilar length 27·7; condylo-basal length 29·8; zygomatic breadth 18; breadth of brain-case across squamosal region 16; interorbital breadth 6; nasals, greatest length 14, greatest breadth 3·4, least breadth 2; palatal length 18·5; palatilar length 15·6; length of palatal foramina 6; length of upper tooth-row 4·8.

Hab. Lehutitung, Kalahari. Altitude 3500 feet.

Type. Adult female. B.M. no. 10. 6. 3. 33. Original number 27. Collected on May 29th, 1909.

This sandy-coloured form must evidently be recognized as a desert race of the Namaqualand species, *D. auricularis*. The resemblance in colour between the cotype of *D. auricularis* and the specimens from the Kalahari Desert is due to the black hair-tips of the cotype having faded to a brownish-red colour, thus giving the skin a general reddish appearance, rather similar to the sandy tint of the desert form. The true colour of *D. auricularis* is exhibited in a series of recently collected specimens from Kuruman and Namaqualand, where the general colour of the upper surface and flanks is far less red than in the Kalahari specimens, owing to the predominating olive tint produced by the dark brownish coloured hair-tips mixing with yellowish subterminal rings. These dark hair-tips are almost entirely absent in this new form, except down the middle of the back and on the hind part of the head, these regions being slightly darker than the rest of the body.

"This mouse is, I believe, pretty plentiful throughout the drier parts of the Kalahari. I always noticed its holes, generally in little clumps of 3 or 4, around the edges of the dry salt-pans which are scattered all over the desert. The specimen obtained was smoked out of its hole; they are not easily caught in traps. I have once or twice seen them outside their holes in the daytime."

14. *Dendromus jamesoni*, Wrought.

♀ (preserved in spirit). Lake Ngami.

The Ngami *Dendromus* would appear to be identical with the South African species, *D. jamesoni*, recently described by Wroughton from Zoutpansberg. Probably the colour of the hair is rather paler than that of the type; but it is impossible, at present, to decide this point satisfactorily, as the Ngami specimen has been preserved in spirit.

"I have always found these tree-mice very difficult to catch. The specimen obtained was caught at night on the ground in mopani forest by the light of a bright lantern, which appeared to dazzle it. I know nothing of their habits."

15. *Steatomys pratensis*, Pet.

♂. 70; ♀. 66, 71, 72. Mababe Flats, Ngamiland.

"I found these mice living in small colonies in the dry mopani forest near the marshes; their holes do not go deep into the ground, but spread out for a considerable distance into numerous ramifications. They refused all kinds of baits, and were only obtained by digging them out."

16. *Epimys nigricauda*, Thos.

♀. 11. Molopo River, South Africa.

"These mice frequent the kameel-thorn forests all over the Kalahari, especially where the trees are large, and they seem more numerous in the neighbourhood of water. They breed and spend all the daytime in the trees, only coming down on to the ground at night to feed. They generally choose an old hollow tree, into which a great quantity of dry grass is packed, sometimes as much as 20 feet from the ground. By setting fire to the nest they are easily smoked out, but not so easily caught, as they are very expert climbers and jump from the ends of a bough into a bush and so to the ground and escape in the grass."

17. *Epimys damarensis*, de Wint.

♂. 41, 48, 50, 74; ♀. 40, 42, 49. Lake Ngami.

This series is of considerable interest, as with the exception of the type the only other representative of the species in the Museum collection is an imperfect and rather faded example collected by Andersson more than fifty years ago. Hitherto it has been impossible to decide with certainty the relationship of the species, but it is now evident, from examination of the skulls, that *E. damarensis* is closely allied to *E. nigricauda*, Thos., and from Mr. Woosnam's field-notes it appears that both species are semi-arboreal.

"The habits of this species are identical with those of *E. nigricauda.*"

18. *Epimys namaquensis*, A. Smith.

♀. 5, 12. Molopo River, S. Africa.
♂. 20; ♀. 19. Lehutitung, Kalahari.
♂. 37. North of Okwa, Kalahari.
♀. 67. East bank of Tamalakan River, Ngamiland.

"This species does not climb trees, but I have frequently found their nests in old hollow trees which were lying on the ground. They are fond of frequenting rocks and the dry beds of spruits. When smoking out one of these nests in a fallen tree once, rather an extraordinary thing happened. For a long time there was no signs of any mouse, then suddenly the female came tumbling out on to the ground with four new-born hairless young ones apparently hanging on to her mammæ; she may have had one in her mouth, but three were certainly hanging on to the mammæ."

19. *Epimys woosnami*, Schwann.

♂. 63, 65. East bank of Tamalakan River, Ngamiland.

"These mice were caught on the edge of the marshes, where they were living in the burrows of *Tatera brantsi perpallida*; they were rather uncommon apparently, as they were only caught in the proportion of one to 20 *Tatera*. It is remarkable that both these specimens of *Epimys* had been attacked by some parasitic fly, probably *Cordylobia anthropophagus* or some near species: the maggots were in both cases in the scrotum, which was much enlarged and full of pus; in one case the testes were diseased and one almost entirely sloughed away. The mice were otherwise in good condition and fat. No specimens of *Tatera* were found infected. It is possible that, owing to some habit, this mouse is peculiarly subject to these parasitic flies, which, destroying the reproductive organs, are exterminating the species in the locality."

20. *Epimys microdon*, Pet.

♂. 47; ♀. 45. Lake Ngami.

21. *Epimys coucha*, Smith.

♀. 46. Lake Ngami.

22. *Leggada bella induta*, Thos.

♂ ♀ (preserved in spirit). Lake Ngami.

23. *Saccostomus anderssoni*, de Wint.

♂. 16, 18; ♀. 14, 15, 17, 21. Lehutitung, Kalahari.

♂. 4, 7, 9; ♀. 8. Molopo River.

♂. 59; ♀. 58. West bank of the Tamalakan River, Ngamiland.

Although this series is rather paler in colour than de Winton's type, there seems to be no reason why these Kalahari and Ngamiland specimens should be considered as other than true *S. anderssoni*.

It is interesting to note that Mr. Woosnam obtained four specimens of this species near the Molopo River, not very far north of Kuruman, the type locality of *S. hildæ*, Schwann. *S. hildæ*, compared with this new series of *S. anderssoni*, appears as a very much darker animal, especially noticeable in the young specimens, the young of *S. anderssoni* being rather paler than the adults, while in *S. hildæ* they are a good deal darker.

"I found this mouse plentiful on the rocky banks of the Molopo River and at several places in the Kalahari up to Ngamiland. One was caught on an island in the middle of the Okovango marshes. They feed largely on the beans of the kameel-thorn (*Acacia*) trees."

24. *Arvicanthis pumilio deserti*, subsp. n.

♀. 13. Lehutitung, Kalahari.

♀ (in spirit). Kakia, Kalahari.

A pale sandy-coloured form allied to *Arvicanthis pumilio griquæ*, Wroughton.

Size and general proportions as in *A. p. griquæ*. General colour of upper surface pale sandy yellow (between putty-colour no. 3 and pale ecru no. 3, 'Repertoire de Couleurs'), rather paler on the flanks and sides of head. Dorsal stripes much fainter and less evident than in *A. p. griquæ*, light orange-brown in colour; the two median stripes not prolonged forwards on to head. Ears covered with short orange-coloured hairs; no well-marked dark margin to ears. Backs of hands and feet yellowish white. Entire underparts white, washed with greyish buff. Tail light brownish yellow above; underside white.

Skull larger than that of *A. p. griquæ*, with rather larger auditory bullæ, flatter and broader brain-case, and broader nasals. Molar teeth rather larger than in *A. p. griquæ*.

Dimensions of the type (measured in the flesh):—

Head and body 115 mm.; tail 116; hind foot 22·25; ear 14.

Skull: greatest length 29·9; basal length 26; condylo-basal length 27·9; basilar length 24·3; condylo-basilar length 26; zygomatic breadth 14·9; breadth of brain-case across squamosal region 12·6; interorbital breadth 4·7; nasals, greatest length 11, greatest breadth 3·6, least breadth 1·5; palatal length 14·5; palatilar length 12·5; width of palate inside m^1 2·5; width of palate outside m^1 5·9; length of palatal foramina 6; post-palatal length 11·3; length of upper cheek-teeth 5.

Hab. Lehutitung, Kalahari. Altitude 3300 feet.

Type. Adult female. B.M. no. 10.6.3.69. Original number 13. Collected May 18th, 1909.

This Kalahari *Arvicanthis* is distinguished at once from all the other members of the group by the extreme paleness of the general colour of the dorsal surface; the only form at all approaching this condition is *A. p. cinereus*, Thos., where the general colour of the upper surface is pale slaty grey, very different from the light sandy coloration of this desert form.

"*Arvicanthis* is a very common genus both at Kuruman and on the Modder River, but not at all common in the Kalahari, and only met with near water. I have never seen this mouse far from water. They are diurnal."

25. *Georychus lugardi*, de Wint.

♂. 2; ♀. 3, 10. Molopo River.
♂. 26. Lehutitung.
♀. 73. Mababe Flats, Ngamiland.

"*Georychus* is plentiful throughout the whole Kalahari. I have seen their mounds 100 miles from water."

26. *Lepus ochropus kalaharicus*, subsp. n.

A pale greyish-buff form of *Lepus ochropus*.

Size and proportions as in *L. ochropus*. General colour of upper surface pale greyish white, faintly tinged with buff (putty-colour no. 1, 'Repertoire de Couleurs') and finely speckled with black. Shoulders and anterior back lighter in colour than hind portion of body, where the black speckling is more in evidence. Flanks rather lighter in colour than rest of upper parts, gradually turning yellowish towards the ventral surface, a pale yellow area separating the white underparts from the greyish flanks, as in *L. ochropus*, but here the yellow is very much lighter in colour (flesh-colour no. 2, 'Repertoire'). Individual hairs of back with whitish bases, the colour changing to dark brownish black towards the middle; apical portions bicoloured, subterminal rings buffish white, tips blackish brown. Some of the longer hairs on the back with white tips. Hairs on flanks with white bases and buffish-white tips, a few of the hairs with black tips. Nape of neck, behind ears, pale buffish white, a good deal less yellowish than in *L. ochropus*. Forehead and back of head rather darker than rest of face. Dark lines above eyes, on sides of muzzle, well defined. Nasal region yellowish white. Eyes surrounded with whitish rings, the white coloration extending forwards for a short distance on the sides of the muzzle, just beneath the dark frontal stripes. Cheeks and sides of neck similar in colour to flanks. Ears markedly paler and greyer than in *L. ochropus*; black tips not nearly so evident, and the yellow colour on the outer sides very much greyer. Rump greyish; hairs with slate-grey bases and whitish tips, only a few of the hairs having buff-coloured or black tips. Fore limbs buffish, paler than in *L. ochropus*. Inner sides of hind limbs pale buffish white (maize-yellow no. 2, 'Repertoire'), a little richer in colour than the yellowish tint on the flanks. Backs of hands and feet buffish white (maize-yellow no. 1, 'Repertoire'). Belly, underside of thighs, and lower lip white; hairs white throughout. Throat and chest buffish; hairs with pale slaty-grey bases and long buffish-white tips. Underside of fore limbs and chin buffish white. Tail as in *L. ochropus*, white with a well-defined dark dorsal marking.

Skull very similar to that of *L. ochropus*.

Dimensions of the type (measured in the flesh):—

Head and body 420 mm.; tail 96; hind foot 108; ear 134.

Skull: greatest length 82; basal length 64; condylo-basal length 70·5; basilar length 61·5; condylo-basilar length 67·5; zygomatic breadth 40·5; interorbital constriction 12·5; breadth of brain-case (across squamosal region) 29; nasals, greatest length 35·4, greatest breadth 18·6, least breadth 12; palatilar length 29·4; length of palatal foramina 20·7; length of upper cheek-teeth, from front of first premolar to back of last molar, 14·2.

Hab. Lehutitung, Kalahari. Altitude 3300 feet.

Type. Adult female. B.M. no. 10. 6. 3. 75. Original number 22. Collected May 21st, 1909.

Like most of the other new forms described in this paper, this hare would appear to represent a desert race of a South African species, and, as such, it is here described as a subspecies of *L. ochropus*, from which it is distingushed by the far paler colour of dorsal surface.

"Hares were very rarely seen in the Kalahari, but that they are to be found throughout the desert is proved by their spoor. A few were found round the big salt-pans at Lehutitung and again at Okwa Spruit."

XLIV.—*New Species of Heterocera from Costa Rica.*—II.

By W. SCHAUS, F.Z.S.

Arctiadæ.

Aphyle intorta, sp. n.

♀. Palpi red. Head and thorax brownish red. Abdomen crimson above, buff underneath. Legs roseate and buff; tarsi buff. Primaries lilacine red; a faint antemedial and postmedial dark line from below cell to inner margin; the outer margin pale yellow, incurved from apex to just below vein 6, then inwardly straight and perpendicular to tornus, separated from the dark portion of the wing below vein 6 by a purplish line outwardly edged with roseate; subterminal red points on veins 3, 4, and 5. Secondaries crimson. Underneath roseate, without the dark line separating the two colours on primaries.

Expanse 39 mm.

Hab. Sixola River; Sept.

Closely allied to *A. incarnata*, Wlk.

Automolis vampa, sp. n.

Body ochreous; two black points posteriorly on thorax. Legs streaked light and dark grey. Wings ochreous. Primaries: a subbasal dark point below cell; inner margin medially lilacine, with a black streak; basal half of costal margin and end of cell lilacine, streaked with black; black streaks from cell reaching outer margin between veins 2 and 3, 4 and 5, and 5 and 6; shorter streaks above veins 3, 6, and 7, these streaks more or less edged with lilacine. Underneath: primaries with a dark space at end of cell and streaks above veins 2–4; the costa lilacine.

Expanse 35 mm.

Hab. Sixola River; Sept.

Very closely allied to *A. polystria*, Schs.

Melese sixola, sp. n.

Antennæ long, pectinated. Palpi roseate, salmon-colour in front. Head salmon-colour; a grey spot on frons. Tegula and patagia grey, edged with roseate. Abdomen roseate above, buff underneath. Legs roseate and grey; tarsi whitish. Primaries grey, thinly irrorated with darker scales; a crimson streak on subcostal vein; a subbasal greyish streak below cell, followed by a small red and black spot; a small red spot in cell, partly edged with black scales; base of inner margin roseate, followed by an antemedial large yellow-white spot, edged with red and divided by a red streak on submedian; two small similar spots medially above and below the submedian; a small red spot between veins 2 and 3; a postmedial whitish streak from vein 5 to costa, edged with red. Secondaries roseate.

Expanse 25 mm.

Hab. Sixola River; Sept.

Melese sixola frater, subsp. n.

Like *Melese sixola*, but with only a small crimson postmedial spot between veins 5 and 6, and no spot between veins 2 and 3.

Expanse 23 mm.

Hab. Sixola River; Sept.

Melese quadrina, sp. n.

Antennæ fasciculate. Palpi roseate, the second and third joints grey in front. Head, collar, and thorax greyish brown, the collar with a few red hairs posteriorly. Abdomen roseate above, buff underneath. Legs: tarsi whitish; tibiæ roseate, streaked with grey. Primaries light brown; a small subbasal black spot below cell; a black quadrate spot in middle of cell; a small antemedial white spot edged with black resting on submedian vein; a postmedial white spot on costa, and below it between veins 5 and 7 two white points edged with black; from end of cell to middle of inner margin four indistinct dark brown spots. Secondaries roseate, below and beyond cell slightly hyaline whitish.

Expanse 31 mm.

Hab. Juan Vinas; Jan., Nov.

Ochrodota marina, sp. n.

♂. Palpi brown, tipped with ochreous. Frons light brown, vertex whitish. Tegula and patagia white, edged with brown. Thorax posteriorly dark brown. Abdomen yellow; a lateral row of black spots and a subdorsal black spot on last segment. Primaries dark brown, darkest along inner margin, medially below vein 2, and beyond cell; base, antemedial space above submedian, cell to near end, and costal margin to end of cell whitish, with reddish-brown annular and irregular lines; apical portion above vein 6 also whitish, with similar lines. Secondaries yellow; the outer margin black, narrowing at anal angle and also narrower at apex. Underneath similar, but paler.

Expanse 33 mm.

Hab. Sixola River; March.

Pachydota josefina, sp. n.

♂. Head, thorax, legs, and abdomen below dark brown; the vertex creamy white; the coxæ orange. Abdomen above orange, with a large dorsal black space on second and third segments, followed by three black subdorsal spots; lateral black marks adjoining the dark underside. Primaries lilacine brown, with the usual darker transverse streaks, the postmedial bifurcating below vein 3 and containing the pale discocellular; the subterminal coalescing with the dark marginal shades below vein 3. Secondaries brown; the discal area whitish. Underneath, the primaries are brown, with darker veins; the secondaries brownish white, with dark veins; a brown costa and apex.

Expanse 55 mm.

Hab. Juan Vinas.

Pachydota inermis, sp. n.

♂. Head and thorax black-brown; vertex creamy white; fore coxæ orange. Abdomen above orange; first segment black; second and third with black subdorsal tufts, leaving only large yellow lateral spots; the other segments with fine transverse black lines posteriorly; underneath black, with lateral yellow tufts at base, anal hairs black. Primaries lilacine brown, with dark markings, the base dark; an antemedial band; the postmedial enclosing a light spot at end of cell and bifurcating below vein 3, where the outer portion extends to outer margin; an oblique subapical wavy line from costa to vein 3; an apical irregular patch. Secondaries: the basal area to beyond cell dirty white; the veins dark; the outer margin broadly brown. Underneath: secondaries dirty white, the costa tinged with lilacine; the subcostal and discocellular dark brown; the other veins light brown.

Expanse, ♂ 47, ♀ 49 mm.

Hab. Sixola River, Tuis; May.

Pachydota nitens, sp. n.

♂. Body blackish brown; vertex creamy white; all the coxæ yellow; the abdomen with lateral yellow spots, becoming larger towards last segment, and only separated by a black subdorsal line on the two segments before the last. Primaries shining lilacine brown, with the dark lines as in *P. inermis*, but the outer portion of postmedial continues to inner margin near tornus. Secondaries black, with a semihyaline white space at base, below cell, and slightly in cell. Wings below black, with only the semihyaline space on secondaries.

Expanse, ♂, 50 mm.

The female differs in having the abdomen orange dorsally, except a black subdorsal space on two basal segments, and fine black transverse lines on the two following segments. The secondaries underneath immediately distinguish this species from the female of *P. inermis*.

Expanse, ♀, 52 mm.

Hab. Juan Vinas.

Pachydota nitens, ab. *roseitincta*, ab. nov.

♂. Similar to *P. nitens*, but with the dorsal black band broader, leaving five lateral orange spots. Underneath, the secondaries have the hyaline space broadly edged above and below with roseate, which shows through on the upper surface.

Expanse 50 mm.

Hab. Tuis; May.

Opharus roseistriga, sp. n.

Palpi dark brown, the second segment shaded with buff. Frons dark brown. Vertex and patagia dorsally light buff. Collar roseate, shaded with brown posteriorly. Patagiæ outwardly dark brown. A roseate spot on thorax posteriorly. Abdomen blackish brown; a lateral roseate streak extending dorsally on last segment; anal hairs pale buff. Legs brown, the tarsi tinged with buff. Primaries dark brown, with a vague darker shade at end of cell; the costal margin brownish buff. Secondaries dark brown, slightly hyaline in, below, and beyond cell.

Expanse 43 mm.

Hab. Juan Vinas; June.

Allied to *O. linus*, Schs.

Agoræa inconspicua, sp. n.

Head, collar, and anal segments orange; some brown on frons. Palpi, thorax, and abdomen brown, the outer portion of abdomen dorsally darker. Wings brown; the discal area of secondaries more thinly scaled.

Expanse 30 mm.

Hab. Juan Vinas; February, May.

Brycea carpintera, sp. n.

♂. Body black. Wings black, except the basal half of fore wings, which is orange, with a narrow black space at base and a short basal streak on costa; the basal half of costal margin also orange. Underneath similar.

Expanse 25 mm.

Hab. Tres Rios, on the Carpintera Mountain; Sept.

Heliactinidia sitia, sp. n.

Palpi orange, tipped with grey. Head orange. Antennæ black. Collar and patagia grey, the latter with a darker streak inwardly. Thorax and abdomen orange, with a subdorsal black line. Legs dark grey outwardly, yellowish inwardly. Primaries olive-grey, the veins yellowish; a pale shade from costa above discocellular to inner margin near tornus; a few orange scales on this shade at and above discocellulars. Secondaries orange.

Expanse, ♂ 38, ♀ 40 mm.

Hab. Sixola River; Tuis, Juan Vinas, El Sitio.

Closely allied to *H. flavivena*, Dogn.

Diospage carilla, sp. n.

♀. Legs black, irrorated with metallic green. Head, collar, and thorax black, with metallic-green spots; frons metallic green; patagia with only a short green streak inwardly. Abdomen black; a subdorsal dark green streak, lateral green transverse spots, obsolescent on segments 5 and 6; underneath, last three segments scarlet. Wings black. Primaries: basal third dark gold-green in cell, below cell, and just under submedian vein; a broad postmedial oblique ochreous space from just below costa to below vein 2. Secondaries: basal half dark blue, with a lighter blue streak along median and one near inner margin. Underneath, the secondaries are streaked with blue at base, shortly in the cell, with two spots beyond cell.

Expanse 48 mm.

Hab. Carillo.

Looks very much like *Belemniastis trotschi*, Druce.

Calidota quadripunctata, sp. n.

Palpi and body below brown. Legs brown; the coxæ yellow. Frons dark brown. Vertex and collar buff, the former with a single black spot, the latter with two black spots. Thorax light brown. Abdomen above yellow, with a subdorsal row of black spots and a brownish tuft near base. Primaries light brown; a small black spot at end of cell and three spots beyond cell, the two spots between veins 4 and 6 much larger than the spot between 3 and 4. Secondaries pale greyish brown, the discal area thinly scaled.

Expanse 49 mm.

Hab. Avangarez; July.

Allied to *C. rema*, Dogn., but quite distinct.

Euchætes mitis, sp. n.

Head and thorax grey; a roseate line behind head. Legs greyish brown; fore coxæ streaked with roseate. Abdomen roseate above, with subdorsal and lateral row of black spots, the ventral surface grey. Fore wings grey. Hind wings whitish in the male, dark grey in the female.

Expanse, ♂ 33, ♀ 41 mm.

Hab. Juan Vinas, El Sitio.

This is subsp. 2 of *Euchætes expressa*, Edw., in the 'Catalogue of Lepidoptera Phalænæ.'

Lymantriadæ.

Eloria torrida, sp. n.

Body and legs creamy white. Wings white, thinly scaled. Primaries: the costa finely dark brown; the apex and outer margin above vein 4 narrowly brown. Underneath similar, with the costa more broadly brown.

Expanse 32 mm.

Hab. Sixola River, Esperanza, La Florida.

Eloria sixola, sp. n.

Head and collar yellow. Legs streaked with dark brown and grey. Body whitish, thinly scaled; some yellow hairs on patagia. Wings white, thinly scaled, the veins more heavily scaled. Primaries: the costa finely brown. Underneath the costa of primaries narrowly, the outer margin and apex broadly brown, narrowing at tornus.

Expanse, ♂, 44–46 mm.

Hab. Sixola River; April.

Eloria geometrina, sp. n.

Palpi dark grey, orange at base. Head, collar, spots below wings, and anal tufts orange; body otherwise grey with faint whitish transverse lines posteriorly on abdominal segments. Legs brown streaked with white. Wings white, thinly scaled. Primaries: the costa narrowly, the outer and inner margins broadly dark grey; a greyish streak in cell, and a greyish diaphanous shade below cell; a broad oblique grey shade from median between veins 2 and 3 to inner margin. Secondaries: the outer margin dark grey; a grey streak from base to anal angle along the inner margin, and a short streak along vein 2 on postmedial space to outer margin.

Expanse 36 mm.

Hab. El Sito; May. Juan Vinas; May.

Orgyia povera, sp. n.

Head and thorax dark brownish grey. Abdomen brown. Primaries light brown, darker on basal half of costa and cell; a geminate faint reddish-brown line at end of cell; a vague darker antemedial shade below cell to inner margin; an indistinct and interrupted postmedial lunular line followed by darker but indistinct spots; fringe dark grey. Secondaries dark brown.

Expanse 31 mm.

Hab. Avangarez Mines; July.

Orgyia costaricensis, sp. n.

Body buff, the thorax mottled with darker scales; subdorsal tufts of dark curly scales on first and third segment of abdomen. Primaries: the basal third mottled buff and brown, limited by a slightly oblique dark brown antemedial shade, and containing an interrupted black basal line and a large ovate brown spot below the cell; the costa from antemedial to postmedial broadly creamy buff or greyish; a steel-grey medial shade from subcostal to submedian, followed at end of cell by an interrupted geminate brown line; from end of cell to postmedial the space is also filled in with steel-grey; the postmedial is outcurved beyond cell, incurved below vein 2, thick, black, lunular, followed at apex by some black and buff; the outer margin is light brown partly shaded with grey; sometimes a terminal dark line. Secondaries creamy buff, with some dark marginal shading at apex.

Expanse 29 mm.

Hab. Tuis; June. Juan Vinas; June.

Allied to *O. falcata*, Schs.

Eupterotidæ.

Apatelodes turrialba, sp. n.

Palpi velvety black-brown. Head and thorax brownish, irrorated with grey; a black shade posteriorly on head. Abdomen lighter than thorax. Primaries grey, the lines and vein 2 black; three antemedial lines close together, the inner one oblique from costa to vein 2, then slightly lunular to inner margin, preceded by small black spots above and below submedian, the middle line faint, interrupted, the outer line very slightly curved, distinct; the two postmedial lines wide apart, oblique from costa, slightly incurved below vein 4, and between them a fine indistinct dark geminate shade; a small subterminal white spot between veins 6 and 7; fringe brown. Secondaries: the base dark grey followed by a broad medial shade still darker, angled at vein 6 and internal nervure; the outer half of wing lighter silky grey; some whitish scales at anal angle, and a blackish shade above them on inner margin. Underneath lighter grey. The primaries with the postmedial lines less distinct; the costa shaded with white; the white spot surmounted by a white streak. Secondaries: an irregular blackish medial line, followed by an indistinct dark line; the postmedial line outwardly shaded with white and much curved near anal angle.

Expanse, ♂, 52 mm.

Hab. Volcano Turrialba, 5800 ft.; Sept.

Apatelodes vitrea, sp. n.

Thorax dark violaceous brown. Abdomen above dark reddish brown. Body below and head light brown. Collar light reddish brown. Primaries dark brown tinged with blackish grey below cell and vein 4, otherwise tinged with reddish; a few whitish scales in place of antemedial line; a lunular fine lilacine subterminal line below vein 5, followed by lilacine scales; a large vitreous spot between veins 6 and 7, and a smaller one between 7 and 8; the outer margin slightly incurved above vein 6 and below vein 5. Secondaries dark reddish brown; some whitish scales and darker brown spots on inner margin. Underneath light reddish brown, the inner margin of secondaries broadly paler, and with a medial and a postmedial darker curved line, the former blackish on discocellular.

Expanse 34 mm.

Hab. Tuis; Sept.

Apatelodes paratima, sp. n.

Head and palpi brown. Thorax buff. Abdomen above: first segment dark velvety brown, other segments buff shaded with brown on last segments and with a subdorsal row of small brown spots; two lateral reddish-brown spots near base. Body underneath and tufts on legs reddish brown. Primaries buff; small antemedial, medial, and postmedial brown spots on costa; a larger triangular spot on costa before apex broadly bordered with white, which is really part of the curved whitish subterminal line, almost obsolete below vein 6; a dark point in cell; an oblique brown spot on inner margin at a third from base; the outer margin shaded with grey between veins 2 and 5. Secondaries brownish buff with a faint whitish curved outer line. Underneath: primaries buff; the costa creamy buff; a brown streak on discocellular; a grey subcostal streak; dark grey and brown shadings from cell to subterminal, which is more distinctly marked; the spot on costa before apex grey; the outer margin at apex ochreous brown. Secondaries ochreous brown, broadly shaded with white on inner margin, containing a dark basal streak and a postmedial brown patch; the discocellular dark brown; the costa white irrorated with grey; the subterminal white line straight from costa, angled between veins 3 and 4; the veins on brownish portion dark grey irrorated with reddish brown.

Expanse 32 mm.

Hab. Avangarez, Tuis.

Allied to *A. imparata*, Dogn.

Olceclostera magniplaga, sp. n.

Head and thorax lilacine grey with brown irrorations. Abdomen reddish brown; fine transverse white lines posteriorly on segments; two sublateral white spots on basal segments. Primaries lilacine grey; a short black streak at end of cell edged with lighter grey; a broad irregular antemedial darker transverse shade containing a dark point on median and submedian veins; a similar postmedial shade, broadest beyond cell, inwardly edged by a darker shade slightly outcurved beyond cell and below vein 2, and outwardly edged by an interrupted brown line much outcurved towards apex and between vein 2 and submedian; a large transparent spot subterminally between veins 5 and 6, rather elongated with straight edges, and a slight transparent dash below vein 5; the outer margin above vein 2 brown, widest between veins 4 and 5, partly edged by a lunular brown line;

a brownish streak on costa near apex. Secondaries brown, darkest on inner area; a postmedial darker brown line. Underneath light brown, with dark points at end of cell, two postmedial lines on primaries, incurved below vein 5, and on secondaries a dark medial line, and an outer finely lunular line.

Expanse, ♂, 45 mm.

Hab. Juan Vinas; June. El Sitio; May.

Olceclostera nigripuncta, sp. n.

Body lilacine grey with a few brown irrorations; a sublateral reddish-brown spot on first two segments crossed by two white lines. Primaries dull grey; traces of a basal and an antemedial blackish line; a medial and a postmedial brown shade, the latter outwardly curved beyond cell and above inner margin, and followed by a lunular dark line punctiform on veins; a small black spot on inner margin just before middle; a subterminal very small hyaline spot between veins 5 and 6; a minute point at end of cell; indistinct subapical lunular marks. Secondaries brown with traces of a pale outer line. Underneath the wings are greyish buff with black points at end of cell; a single outer dark line on primaries; a brown medial shade on secondaries followed by a blackish-brown punctiform lunular line.

Expanse 39 mm.

Hab. Juan Vinas; June, November. La Florida; July.

Olceclostera indentata, sp. n.

Palpi, legs, head, and thorax mottled grey and brown. Abdomen reddish brown above, irrorated with grey scales, and fine greyish transverse lines posteriorly on segments; underneath grey irrorated thinly with brown, and with sublateral white points, larger on two basal segments. Primaries lilacine grey, thinly irrorated with brown; the markings brown; a dot and very faint basal line; a geminate antemedial line, the outer portion heavier, incurved in cell and below vein 2; a dark point at end of cell; the postmedial outcurved beyond cell, then lunular to inner margin followed by a series of dark points connected by a fine greyish-white lunular line; a transparent spot between veins 5 and 6, indentate on its outer side; a fine subterminal lunular line from costa to vein 3; the fringe dark brown. Secondaries brown with traces of a medial and postmedial line. Underneath: primaries light brown, the costal and outer margins shaded with grey; a brownish streak on discocellular; the postmedial line not lunular below vein 2, and followed by another line slightly lunular. Secondaries greyish irrorated with brown; a black point at end of cell; a medial thick brown line, outcurved beyond cell; a postmedial row of dark points indistinctly connected by a fine wavy line.

Expanse, ♂, 40 mm.

Hab. Sixola River; March.

Oloeclostera avangareza, sp. n.

Head and thorax mottled grey and brown. Abdomen light brown irrorated with grey and brown. Primaries irrorated grey and brown; geminate antemedial and postmedial lines, within which the colour is more of a brown; the antemedial line is basally indentate on its inner side, nearly straight on its medial side; the postmedial on its basal side is curved beyond cell, then nearly straight to inner margin and heavily marked, its outer part is fine, slightly wavy, and outcurved between vein 2 and submedian; the outer margin brownish, limited by a fine lunular line; a small subterminal hyaline spot between veins 5 and 6. Secondaries light brown; a dark line at end of cell; a dark median line; a fine postmedial line, slightly outcurved before reaching the inner margin. Underneath light brown; a dark streak on discocellular of primaries and the two postmedial lines only; on secondaries the outer line is whitish and angled between veins 5 and 6.

Expanse 34 mm.

Hab. Avangarez Mines; July.

Closely allied to *O. azteca*, Schs.

Zanola tuisa, sp. n.

Body brownish buff, the legs irrorated with darker brown. Primaries brownish buff, thinly irrorated with brown scales; an antemedial brownish shade bifurcating on costa; a small white spot at end of cell containing a black point; a postmedial brown shade incurved between vein 4 and just above submedian, followed by a fine lunular line punctiform on veins; two small subterminal white spots between veins 4 and 6, separated by a dark shade, the upper spot being the larger; a dark brown streak on costa before apex; the fringe dark brown between the veins. Secondaries whitish buff; a dark point in cell followed by a medial and a postmedial brown wavy line; the fringe dark brown. Underneath the secondaries are irrorated with dark brown, the discal spot is larger, and the postmedial line more dentate, partly shaded with black.

Expanse 33 mm.

Hab. Tuis ; June. Sixola River ; Sept.

Close to *Z. ennomoides*, Wlk.

Zanola fieldi, sp. n.

Body above dark brown slightly tinged with reddish, underneath buff, the abdomen with lateral oblique brown streaks and black points. Primaries dark brown-grey ; the costal margin and basal third below between cell and submedian dull reddish brown ; traces of an antemedial, medial, and postmedial dark line below the subcostal vein ; some buff scales on discocellular ; a fine dark subterminal outwardly lunular line ; a terminal inwardly lunular line contiguous to a small patch of buff scales between veins 4 and 5 ; a light brown shade at tornus. Secondaries dark brown shaded with reddish brown above cell and veins 6, and also a whitish medial space on costa. Primaries below brown ; the inner margin and outer margin below vein 5 buff ; the postmedial and subterminal lines nearly straight. Secondaries below buff, irrorated thinly with light reddish brown ; a dark point at end of cell and a reddish-brown medial shade ; the subterminal brown and grey partly edged with black, very broad with the margins dentate. The costal margin of secondaries is excised, and the apex is also excised.

Expanse 30 mm.

Hab. Sixola River ; March.

Named after Mr. H. M. Field, whose great kindness in lending me his powerful acetylene light enabled me to procure many new species.

Zanola elongata, sp. n.

Head and thorax reddish brown. Abdomen above dark brown. Primaries : the costal margin dull brown with some antemedial white scales ; cell and space beyond to postmedial dark reddish brown ; the discocellular black edged with bright reddish brown ; on basal half below cell a large bright reddish-brown space crossed by the dark brown antemedial line ; from this space to postmedial line below cell and vein 3 the colour is reddish brown ; the postmedial line is dark brown, wavy, and almost subterminal ; the outer margin dark brown, somewhat paler at tornus ; a subterminal dark lunular line chiefly visible between veins 4 and 7, where it crosses a patch of bright reddish brown which is widest between veins 4 and 5 ; below vein 5 the margin is wavy and oblique, giving the wing a long and narrow appearance.

Secondaries dark brown. Underneath the primaries are dark brown; the inner margin pale buff; a pale marginal space between veins 4 and 7, and a nearly straight postmedial line. Secondaries underneath light brown mottled with lilacine and reddish brown; a dark brown shade from apex to middle of inner margin, crossed at costa by the black postmedial line which is lunular, dentate; a wavy paler brown shade on outer margin. The costa of secondaries is straight and slightly produced upwards at apex.

Expanse 41 mm.

Hab. Tuis; August.

Bears a superficial resemblance to *Z. verago*, Cr.

Colla cœlestis, sp. n.

♂. Legs white shaded with brown. Palpi brown. Head and thorax white; some brown on frons. Abdomen olivaceous brown above, laterally and underneath white. Wings white opalescent. Primaries: some antemedial and postmedial ochreous spots on costa; a broad subterminal space from vein 4 to costa broken by the veins and divided by a fine white line; a single subterminal spot between veins 2 and 3, these spots are apparently grey but also opalescent in the proper light; a marginal grey shade, not opalescent, cut by the veins; a terminal white line; fringe white outwardly, grey basally. Secondaries: some olivaceous-brown spots on inner margin, a grey spot above anal angle, and some marginal grey spots between angle and vein 4.

♀. Wings dirty white. Primaries: a basal space, and two antemedial smoky shades, slightly curved; a geminate postmedial shade curved from costa to vein 4, partly coalescing, followed by a broader similar shade, interrupted between veins 3 and 4. Secondaries as in the male.

Expanse, ♂ 27, ♀ 34 mm.

Hab. Sixola River; March, September.

Dalceridæ.

Acraga hamata, sp. n.

Primaries somewhat falcate, slightly produced and rounded below vein 4. Secondaries incurved below apex, the anal angle produced. Antennæ brownish buff. Head and thorax deep yellow. Abdomen pale yellow. Wings bright yellow; the costal margin of secondaries whitish.

Expanse 28 mm.

Hab. Juan Vinas; June. Tuis; May.

Acraga goes, sp. n.

♂. Lemon-colour; the frons slightly tinged with grey, the inner margin of primaries a trifle darker; the costal margin of secondaries slightly whitish.

Expanse 18 mm.

Hab. Guapiles.

Anacraga philetera, sp. n.

♂. Body orange. Primaries orange, darkest on inner margin. Secondaries orange; the costal margin broadly whitish yellow. Underside paler.

Expanse 22 mm.

Hab. Sixola, La Florida.

Dalcera ? innoxia, sp. n.

Head and thorax grey mottled with white. Abdomen dark grey above with some white hairs. Primaries greyish brown; a white spot at base; a white streak below cell, interrupted by veins 2 and 3; a white streak above basal half of inner margin; some white on extreme inner margin on outer half; fringe white with dark spots at end of veins, and faint terminal white markings between the veins.

Expanse 32 mm.

Hab. Bajos del Toro Amarillo ; April.

This species will require a new genus, as veins 7, 8, 9 are stalked, 10 is free, and 11 anastomoses with subcostal.

Minacraga argentea, sp. n.

♀. Head and thorax anteriorly whitish buff. Thorax posteriorly and abdomen silvery. Primaries silvery buff, except a large silvery-white irregular ovate space extending from the costal margin to inner margin near tornus, finely edged with ochreous and dark brown scales; terminal dark points on veins. the largest at tip of vein 7. Secondaries white irrorated with silver scales. Underneath white.

Expanse 30 mm.

Hab. Juan Vinas; June.

Dalcerides bicolor, sp. n.

♀. Head, thorax, legs, and abdomen below orange-red. Abdomen above blackish brown. Primaries orange-red, the veins slightly darker. Secondaries black, thinly scaled.

Expanse 28 mm.

Hab. Volcano Poas; May.

Megalopygidæ.

Mesocia fluxa, sp. n.

Head whitish; frons light brown. Legs light brown partly streaked with white. Collar and thorax white with some light brown and greenish-white shadings. Abdomen black; anal hairs white, and a white subdorsal tuft at base. Primaries: costa, base, inner margin finely, and apex white, the latter streaked with grey; the cell just beyond it, below it, and narrowly along inner margin pale greenish irrorated with black; the outer margin below vein 7 broadly light brown with intervenal grey streaks; an indistinct marginal white line. Secondaries black, the veins terminally whitish, and whitish shadings at anal angle.

Expanse 27 mm.

Hab. Sixola River.

Pattern of wings similar to *M. lorna*, Schs., but different in colour.

Trosia venata, sp. n.

Antennæ, head, and collar ochreous brown. Frons and legs blackish brown. Thorax pale brown; patagia whitish. Abdomen white tinged above with yellow. Wings white. Primaries: the costal margin and veins light brown.

Expanse 39 mm.

Hab. Avangarez; July. Esperanza; May.

Megalopyge montana, sp. n.

Head reddish brown, darkest on vertex. Thorax mottled reddish brown and buff posteriorly. Abdomen dark brown with transverse whitish bands. Primaries: the base and outer margin pale buff; the intermediate space brown, darkest antemedially and on costal margin; some dark spots at base; an outer white line, lunular, separated by the veins and shaded on either side with darker brown, except outwardly between veins 3 and 5; the apical third of costa light brown; a terminal dark line interrupted by the veins. Secondaries light brown; the outer margin pale buff; a terminal interrupted dark line. Underneath brown, the outer margins pale buff; the terminal line as above.

Expanse 34 mm.

Hab. Juan Vinas; February. El Sitio; May.

Allied to *M. salacia*, Druce, but altogether paler.

Lacosomidæ.

Cicinnus tuisana, sp. n.

Head light reddish brown, collar roseate grey. Thorax grey. Abdomen roseate grey, all irrorated thinly with black scales. Wings lilacine grey thinly irrorated with black. Primaries: apex produced, acute, falcate; a dark round spot at end of cell; an indistinct dark antemedial shade; the postmedial oblique from costa, black, angled between veins 7 and 8, then inwardly oblique to inner margin, pale buff, indistinct, finely shaded with black, followed by a brownish shade below vein 3, most heavily marked between 2 and 5 and on submedian; a subterminal red dash across vein 6; the apex slightly darker grey. Secondaries: a black spot at end of cell; a medial curved black line, followed by a broad brownish shade especially on inner margin. Underneath grey with heavier black irrorations, and partly shaded with reddish; a terminal red patch on primaries between veins 3 and 7.

Expanse 48 mm.

Hab. Tuis, Juan Vinas.

Allied to *C. mexicana*, Druce.

Cicinnus prominens, sp. n.

♀. Head and collar reddish fawn, the latter edged posteriorly with grey. Thorax roseate grey. Abdomen reddish brown above, all irrorated thinly with black scales. Wings grey. Primaries: the costal margin for four-fifths roseate buff, crossed by a medial oblique black streak, and a black spot at four-fifths from base; the cell and antemedial area below cell pale reddish, outwardly limited below cell by a wavy dark line, and containing a black basal spot; a white streak on discocellular; the subterminal line fine, black, from costal spot oblique to vein 7 near margin, then inwardly wavy to inner margin at two-thirds from base, followed above vein 5 by a black and red shade, and below vein 4 to inner margin by a large blackish space broken by grey spots and red streaks on veins. Secondaries: some red suffusions at base; a faint antemedial line; a white streak at end of cell; a blackish line beyond cell; the outer margin suffused with dark brown, which extends to a line between veins 3 and 4; the inner margin narrowly whitish grey. Underneath grey with dark striæ; the primaries suffused with dark brown except on inner margin; white streaks on discocellular; the subterminal line dentate much closer to outer margin; a red marginal space on primaries from vein 3 to above vein 7; some red streaks on veins of hind wings. The fore wings are acute and falcate.

Expanse 55 mm.

Hab. El Sitio, Juan Vinas.

Cicinnus latris, sp. n.

Head and collar reddish buff; thorax and abdomen buff, thinly irrorated with black scales. Wings brownish buff, thinly irrorated with black scales and striæ. Primaries: a black spot at end of cell; apex above vein 8 broadly dark grey; traces of a medial dark line; a black spot on costa at four-fifths from base; the outer line oblique from costal space, but intercepted by apical grey space angled at vein 8 and inwardly oblique, fine, blackish, closely followed by a brown line; a faint brown marginal shade from line at vein 4 to tornus. Secondaries: a faint antemedial line; a black medial line followed by a faint wavy line; beyond medial line the wing is dark brown tinged with red at anal angle. Underneath the black striæ are more conspicuous; on primaries the discal area and veins 2–8 are reddish; a bright marginal red space from veins 3–8, limited by the line which is curved from costa to outer margin at vein 3; on secondaries there are traces of an irregular subterminal black line. Primaries acute, falcate.

Expanse, ♂, 54 mm.

The ♀ has the outer margin of hind wings much paler and there is no red underneath.

Expanse, ♀, 63 mm.

Hab. Tuis, Juan Vinas.

Cicinnus lacuna, sp. n.

Head and thorax olivaceous brown. Abdomen buff-brown; a sublateral dark brown streak; anal hairs dark brown. Body thinly irrorated with black scales. Primaries: the costa beyond antemedial line light reddish brown; basal half of wing brown, somewhat paler medially below cell; a fine straight antemedial dark brown line; a black point at end of cell; a broad blackish-brown postmedial line, inwardly oblique from costa to inner margin, beyond which the wing is dark brown, with a fine blackish line close to postmedial, but not reaching costa, and still another faint line separates this space from the olivaceous-brown outer margin; a faint submarginal line from vein 4 to tornus. Secondaries similar, but no discal point, and the lines do not quite reach the inner margin, which is light brown. Underneath the wings are paler; the postmedial line is narrow and slightly wavy, especially on hind wings; the discal spot on fore wings is larger and there is a black point on hind wings; the outer margins are shaded with dark brown. The female is duller; the postmedial line dark brown, geminate; the outer margin broadly olivaceous brown with some black irrorations beyond the line, chiefly on hind wings.

Expanse, ♂ 47, ♀ 66 mm.

Hab. Tuis, Juan Vinas.

Closely allied to *C. unalca*, Schs.

Cicinnus ligina, sp. n.

Body and wings pale fawn-colour, slightly tinged with roseate and thinly irrorated with brown scales. Primaries: a faint wavy light brown antemedial line; an oblique hyaline spot at end of cell finely edged with light grey; a brown outer line obliquely curved from costa at two-thirds from base to vein 7, then oblique to inner margin, inwardly shaded with buff below vein 7; from the angle of line to apex a faint dark line; a subterminal dark brown spot between veins 3 and 4, and a fainter spot between 2 and 3; the tornus slightly excised. Secondaries: the outer margin crenulate; a brown medial line inwardly shaded with buff; a small dark outer spot between veins 3 and 4. Underneath paler; a single subterminal spot on fore wings between veins 2 and 3; the line on hind wings subterminal, excurved between veins 2 and 5.

Expanse 40 mm.

Hab. Juan Vinas, Tuis, Cachi.

Very closely allied to *C. gilia*, Schs.

Cicinnus gentilis, sp. n.

Body and wings grey, thinly irrorated with brown; the veins streaked with light brown. Primaries: a fine antemedial light brown line slightly curved; a fine streak at end of cell running into a hyaline streak on discocellular which is broadly edged with black; an oblique greyish-brown outer line angled between veins 6 and 7, then inwardly oblique to inner margin; a fine greyish streak from line at vein 5 to tornus; a terminal brown shade. Secondaries: a medial brown line; a grey streak from costa before apex to anal angle. Underneath similar, except on hind wings, where there is only a postmedial fine brown line slightly angled at vein 4.

Expanse, ♀, 31 mm.

Hab. Sixola River.

Cicinnus turgidus, sp. n.

Body and wings pinkish fawn-colour, irrorated with dark brown. A dark brown subdorsal streak on abdomen, and the segments posteriorly edged with dark brown. Primaries: a faint wavy antemedial light brown line; an oblique brownish line from middle of costa to spot at end of cell, which is oblique and hyaline; the outer line thick, olivaceous brown, oblique from costa to vein 7 near margin, then angled and inwardly oblique to inner margin, inwardly shaded with buff; a wavy black streak from angle of line to apex; a faint blackish line from vein 4 to near tornus. Secondaries slightly crenulate; a heavy olivaceous-brown medial line, a blackish streak from vein 4 near line to outer margin near anal angle. Underneath paler; the outer line narrower, on secondaries straight from costa near apex to vein 4, then slightly angled; a subterminal black spot on fore wings above vein 2, and a smaller spot below vein 2.

Expanse 60 mm.

Hab. Sixola River; Sept.

Allied to *C. trailii*, Btl.

Cicinnus dulcis, sp. n.

Body yellowish buff. Primaries: the basal third of costa, the base to antemedial line, and the outer margin light olivaceous brown; the medial space slightly light reddish brown, below vein 2 pale roseate lilacine, which extends slightly beyond line, but less marked; the apex above angle of outer line roseate lilacine; the outer line curved from costa to vein 7, blackish on costa and very fine along vein 7, angled and nearly straight to inner margin just beyond middle, dark brown, inwardly shaded with buff; a brownish streak from costa at two-thirds to discal spot which is hyaline and cut by vein 5; a few black irrorations on medial space; a faint darker shade from vein 4 to tornus. Secondaries: the base to line roseate lilacine with a few black irrorations; the medial line straight as on fore wings; the outer margin olivaceous brown tinged with roseate at apex and anal angle. Underneath roseate, the outer margin suffused with brown;

the outer line curved beyond cell on fore wings with a black subcostal spot, and the marginal shades below vein 4 heavier and blackish; on hind wings the line is wavy and slightly angled between veins 3 and 4.

Expanse 46 mm.

Hab. Juan Vinas; January.

Cicinnus volucris, sp. n.

♂. Body and wings dark brown. Fore wings narrow, very falcate; hind wings produced at anal angle. Primaries: the costal and outer margins lighter brown irrorated with dark brown; the outer line still darker brown, angled between veins 6 and 7, closely followed below angle by a blackish line, which at angle extends to apex; a curved shade consisting of black irrorations from vein 3 at line to submedian; an oblique hyaline spot at end of cell, cut by vein 5. Hind wings rather paler; a hyaline point at end of cell; the line as on fore wings diverging near inner margin to anal angle. Underneath paler; the marginal spots beyond line more heavily marked.

Expanse 37 mm.

Hab. Sixola; Sept.

Cicinnus beta, sp. n.

Head, collar, and abdomen above light reddish fawn; abdomen below and thorax roseate grey, thinly irrorated with black. Wings roseate grey, thinly irrorated with black. Fore wings: the costa finely olivaceous brown; an antemedial, curved, light brown shade; a medial dark spot on costa; at end of cell an upright hyaline spot outwardly edged with black and cut by vein 5 forming a small letter B; the outer line fine, brownish, from costa to vein 8, then angled and increasing in width to inner margin, black, inwardly shaded with grey, and followed from below vein 4 by a larger whitish patch thickly irrorated with black; a brownish line from angle to apex; a small reddish shade between 7 and 8; the outer margin dull grey; the veins partly streaked with reddish. Hind wings: the basal half roseate grey with some slight reddish-brown mottling and dark irrorations; a hyaline spot as on primaries, closely followed by a black transverse line, beyond which the margin is duller grey with brown and reddish shadings; at apex a pale patch as at tornus on fore wings, and a similar smaller and darker space at anal angle.

Primaries below with the disk shaded with red, and a marginal red space between veins 4 and 8, inwardly edged by a dark line; some dark shades beyond discal spot; an inwardly curved black line along vein 3 and to inner margin, followed by a pale patch with black irrorations. Secondaries below roseate grey; a reddish-brown patch around discal spot, one at apex, and another at anal angle, the latter surmounted by a semilunar black line.

Hab. Sixola River; Sept.

Closely allied to *C. lemoulti*, Schs.

Cicinnus alsa, sp. n.

Head reddish fawn-colour. Body and wings olivaceous buff, with a few scattered black scales. Primaries: the costal margin tinged with roseate, the extreme costa finely brown; a black spot above vein 8 at four-fifths from base, from which a fine line extends to near margin, where it is angled and forms a slight inward curve to inner margin postmedially; this line is of a darker shade and outwardly bordered with light buff; a small hyaline spot at end of cell, edged with black on basal side; a very faint antemedial darker shade. Secondaries: a subbasal dark shade; a faint whitish spot at end of cell; the outer line as on fore wings, not quite straight. Underneath the wings are more reddish brown; a faint dark fine subterminal line on primaries curved between 7 and 5, straight to 2, then incurved to inner margin; on secondaries slightly incurved below costa, then outcurved to inner margin; the black on discal spot of primaries more conspicuous. The wings are broad, and the outer margin of secondaries evenly rounded.

Expanse 36 mm.

Hab. Turrialba, 5800 feet, Juan Vinas.

Allied to *C. imperita*, Dogn.

XLV.—*A Note on* Alouatta discolor *of Spix*.

By GUY DOLLMAN.

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THE British Museum has recently acquired a series of monkeys from Miritiba, Maranhao, Brazil, which appear to represent the Varied Howling Monkey described by Spix as

Mycetes discolor[*]. The skins are so strikingly different in colour from those of *A. belzebul* that it is at once evident that *discolor* must be recognized as specifically distinct from *belzebul.* The series includes an adult male individual which is quite in agreement with Spix's description and plate.

The following is a brief account of the general appearance of this monkey :—

Size of body, in adult male, a little smaller than in *A. belzebul.*

Top of head and shoulders brownish black, many of the hairs with reddish-orange tips. Forehead and whiskers black. Back, from shoulders to rump, golden brown, a broad, dark, indistinct stripe extending down the mid line, the golden-brown colour being most evident on the flanks. Rump and upper sides of hind limbs black. Inner sides of thighs reddish brown. Upper sides of fore limbs black. Backs of hands and feet black speckled with red. Fingers and toes clothed with long yellowish-red hair. Under surface of body nearly naked, a few golden hairs on the belly and under sides of hind limbs. Throat with dense black beard. Basal half of tail black, speckled with reddish orange, the orange colour becoming more dominant towards the apical portion ; tip yellowish orange.

In another male individual the colour-scheme is much the same, but the black regions are brownish, giving the animal a much lighter appearance.

The above description is sufficient to show how markedly different this species is from *A. belzebul,* and though both species appear to exhibit a considerable degree of colour-variation, there can be no question as to the specific differences between the two forms.

In *A. discolor* the females are very unlike the males, being both smaller in size and very different in colour. The females of *A. belzebul* are also smaller than the males, though not to such a marked extent as in *discolor.* As regards the colour, in *A. discolor* the females appear very much lighter than the males. In one individual the general colour of the upper surface is pale yellowish brown, slightly darker down the mid line. Limbs olive-black above, speckled with yellow. Backs of hands pale yellowish grey. Backs of feet reddish orange ; the toes clothed with long yellow-coloured hairs.

The females would appear to be quite as variable in colour as the males, one specimen in this series being quite reddish brown, suggesting the *senicula* group.

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[*] Spix, Sim. et Vesp. Bras. 1823, p. 48, pl. xxxiv.

The skulls of both sexes are rather smaller than those of *A. belzebul*.

Dimensions (in millimetres):—

	Sex.	Skin.			Skull.							
		Head and body.	Tail.	Hind foot.	Greatest length.	Basilar length.	Zygomatic breadth.	Interorbital breadth.	Breadth of brain-case, across squamosal region.	Palatilar length.	Post-palatal length.	Length of upper cheek-teeth (from front of p^1 to back of m^3).
**A. discolor*......	♂	594	547	134	125	103·5	79	13·4	52	40·8	62·8	35·2
A. belzebul ...	♂	600	605	155	136	111·2	86	15·5	56	47	64	36·6
**A. discolor*.....	♀	456	537	119	103	79	61	9·4	45	34	45·7	28·6
A. belzebul ...	♀	485	580	140	112	86	66	10	54	34·8	51	32

XLVI.—*Descriptions of Three new Freshwater Fishes from West Africa.* By G. A. Boulenger, F.R.S.

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Polypterus ansorgii.

Body as deep as broad in front, its depth 7½ to 8 times in total length. Head nearly twice as long as broad, 4 to 4¼ times in total length, much flattened, with supero-lateral eyes and flat interorbital region; jaws equal in front; length of snout 5 to 5⅓ times in length of head; eye 8 times in length of head, 1⅓ to 1½ times in interocular width; latter less than distance between eye and spiracle; no azygous shield between the nasals; a series of 3 or 4 shields between postorbital and spiracular shields; suboperculum not or but slightly larger than eye. Dorsal with XIII or XIV spines, all strongly overlapping when folded. Anal 12–13. Pectoral reaching beyond vertical of first dorsal spine. 55 or 56 scales in a longitudinal series, 11 to 13 between occiput and first dorsal spine, 42 to 46 round middle of body. Greyish brown above, with 7 or 8 black bars across the back, and a series of 11 to 13 squarish black spots along each side, with smaller and more irregular ones below; fins spotted and mottled with blackish.

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* Skin dimensions taken from dried skins.

Three specimens, measuring from 180 to 205 mm., were obtained in June last at Tchitoli, on the River Corbal, Portuguese Guinea, by Dr. W. J. Ansorge; one of them has been presented by him to the British Museum.

Polypterus ansorgii occupies a position intermediate between Sections I. and II. of the synopsis given by me in the first volume of the British Museum 'Catalogue of African Freshwater Fishes,' but is on the whole nearer the first. The only described species with which it need be compared are *P. congicus* and *P. endlicheri*, in both of which the lower jaw projects distinctly beyond the snout.

Along with the specimens of the new species Dr. Ansorge obtained at the same place several young *Polypterus palmas*, Ayres, measuring 80 to 100 mm., with VIII or IX dorsal spines, and more or less developed external gills.

Gnathonemus brucii.

Depth of body 3 times in total length, length of head $4\frac{1}{2}$ times. Head as long as deep, with curved upper profile; snout $\frac{1}{4}$ length of head; teeth conical, 5 in upper jaw, 6 in lower; chin with feeble globular swelling; eye $\frac{2}{3}$ length of snout, $\frac{1}{2}$ interorbital width. Dorsal 25, originating above fifth ray of anal, its length $\frac{1}{2}$ its distance from head. Anal 30, nearer base of caudal than base of ventral. Pectoral pointed, a little shorter than head, extending to base of ventral. Caudal $\frac{3}{5}$ scaled, with moderately long pointed lobes. Caudal peduncle twice as long as deep. 60 scales in lateral line, $\frac{15}{18}$ in transverse series on body, $\frac{11}{10}$ in transverse series between dorsal and anal, 12 round caudal peduncle. Brown (dirty greenish in life), darker above, paler below; fins dark brown.

Total length 150 mm.

A single specimen from the Ogun River at Aro, S. Nigeria, interior of Lagos, obtained in December by Major G. E. Bruce, and presented by him to the British Museum.

Most nearly related to *G. angolensis*, Blgr., from Angola, which has a larger eye, fewer scales in a transverse series on the body, and a more slender caudal peduncle.

Labeo ogunensis.

Body rather strongly compressed, its depth $3\frac{3}{4}$ to 4 times in total length. Head 1⅔ times as long as broad, its length 4½ to 4⅔ times in total length; snout rounded, very prominent, with nuptial tubercles of unequal size; eye superolateral, in middle of length of head, 5 to 5½ times in length of head, 2½ times in interorbital width; inner surface of lips with numerous transverse plicæ; a minute barbel, hidden in the folds at side of mouth. Dorsal III 10, slightly nearer caudal than end of snout, strongly notched; longest ray as long as or slightly longer than head. Anal II 5, longest ray ¾ to ⅘ length of head. Pectoral as long as head, not reaching ventral; latter below middle of dorsal. Caudal deeply forked. Caudal peduncle as long as deep. Scales 34–35 $\frac{5\frac{1}{2}}{6\frac{1}{2}}$, 3½–4 between lateral line and root of ventral, 12 round caudal peduncle. Dark greenish above (in life) and on the fins, muddy greenish white below.

Total length 170 mm.

Two specimens from Aro, obtained, along with the *Gnathonemus* here described, by Major Bruce, and presented by him to the British Museum.

Allied to *L. obscurus*, Pellegr.; distinguished by the smaller eye and one scale more in a transverse series above the lateral line.

XLVII.—*New African Mammals in the British Museum.*
By Oldfield Thomas.

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Perodicticus faustus, sp. n.

Intermediate between the grey *P. ibeanus* and the brown species of the West Coast.

Size as usual. General colour, when seen at a distance, very much as in the brown species (*P. edwardsi* and *batesi*) of the Kameruns and Gaboon, but on closer examination there prove to be quite a large number of hoary-tipped hairs intermingled with the general fur on the body behind the shoulders—that is to say, the region where in *P. ibeanus* the colour is almost completely hoary grey. The ordinary woolly fur is slaty at base, then drab-coloured, with blackish tips, considerably darker than in *P. ibeanus*; of the thin outer hairs projecting beyond the wool-hairs perhaps half are blackish and half hoary-tipped. Under surface, head, arms, and legs dull drab, a number of hoary-tipped hairs on the outer side of the forearms and thighs; hands and feet grey, more thinly haired than in the allied species. Tail shorter than usual, drab, ticked with hoary.

Skull with small narrow nasals and comparatively slender postorbital processes. Bullæ much swollen both in front and behind. Teeth larger than in *P. ibeanus*, not so large as in *P. edwardsi*; anterior molar (m^1) smaller than m^2; m^3 unusually large, little smaller than m^2 and fully as large as m^1. Small lower premolars low, not exceeding m_1 in height, barely half the height of the caniniform premolar. M_3 as large as m_1.

Dimensions of the type (measured in the flesh):—

Head and body 280 mm.; tail 38; hind foot 51; ear 23.

Skull: upper length 61; basal length 53; greatest breadth 41; nasals 12·5 × 4; palatal length 23; upper cheek-tooth series 18·7; molars only 10·2; m^3 3·4 × 4·7.

Hab. Irneti, Bompona, R. Maringa, Central Congo. Alt. 1200′.

Type. Young adult female. Original number 24. Collected 28th April, 1910, by the Rev. H. M. Whiteside.

This Potto shows a relationship to the British East-African *P. ibeanus* by the presence of the hoary-tipped hairs in its dorsal fur, though these are not nearly so numerous as in the more eastern species. The proportionally large size of its posterior molar, above and below, is peculiar to itself.

Crocidura spurrelli, sp. n.

A large grey species, with a very narrow skull.

Size large, rather less than in *C. manni*. Fur short, close, and velvety; hairs of back about 4 mm. in length. General colour above rather browner than Ridgway's "mouse-grey." Under surface but little lighter, not defined laterally. A small lateral gland present in female. Hands and feet greyish-brown. Tail blackish, nearly naked above, the fine hairs unusually long, but sparsely scattered, more closely set below; longer bristles fairly numerous.

Skull long, unusually narrow; lambdoid crest well developed, the lambdon projecting above the low sagittal crest. Bony palate, as in *C. manni*, produced some little distance behind the molars. As a result, the length of the mesopterygoid fossa is reduced, being no longer than in many far smaller species; it is also unusually narrow, especially in its posterior half.

Dimensions of the type (measured in the flesh):—

Head and body 115 mm.; tail 70; hind foot (s. u.) 19; ear 11.

Skull: condylo-incisive length 29·6; basal length 26·3;

greatest breadth 11·5; interorbital breadth 5; palatal length 13; length of mesopterygoid fossa (excluding the hamular processes) 4·1; length of upper tooth-series 13·3; breadth between outer corners of m^2 8·7.

Hab. Bibianaha, near Dunkwa, inland of Sekondi, Gold Coast.

Type. Old female. B.M. no. 10. 8. 1. 1. Original number 14. Collected 27th June, 1910, and presented by Dr. H. G. F. Spurrell.

This fine shrew is intermediate between the very large W.-African species *C. goliath*, *giffardi*, and *manni*, and the more normal-sized species such as *C. poensis* &c. Its short fur, greyish colour, and narrow skull will also readily distinguish it from any of its allies.

I have named it in honour of its discoverer Dr. H. G. F. Spurrell, to whom the National Museum owes an interesting collection of small mammals from the Gold Coast.

Tatera gambiana, sp. n.

A large pale species; tail almost without tuft.

Size about as in *T. kempi*, the only large * W.-African species hitherto known. General colour much paler than in that animal, dull fawn, more buffy on the sides. Under surface, hands, and feet white as usual. Tail about as long as head and body, very inconspicuously tufted at the tip, brown above, white on sides and below.

Skull readily distinguishable from that of *T. kempi* by the shape of the interparietal, which is broad transversely, narrow antero-posteriorly, its breadth considerably more than twice its length. Anterior palatal foramina not reaching back to the level of the front edge of the root of m^1. Bullæ about as in *T. kempi*.

Dimensions of the type (measured in flesh):—

Head and body 162 mm.; tail 162; hind foot 35; ear 21.

Skull: greatest length 41; basilar length 33·5; greatest breadth 21·7; nasals 15; interparietal 4 × 10·3 (4·3 × 8·7 in *T. kempi*); palatal foramina 7·8; bulla 11; upper molar series 6·7.

Hab. Gambia. Type from Marakissa; alt. 500′.

Type. Adult male. Original number B. 14. Collected 15th May, 1910, and presented by Mr. G. Fenwick Owen. Five specimens examined.

The only member of this group previously known was the *T. kempi* of S. Nigeria, which is a much darker-coloured animal than *T. gambiana*, and differs by the skull-characters above described.

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* The feet of *T. guianæ* are as long as in *T. kempi*, but the skull is markedly smaller.

In addition to *T. gambiana*, Mr. Fenwick Owen obtained in the Gambian region examples of *T. guineæ*, Thos., and *Taterillus gracilis*, Thos.

Arvicanthis linulus, sp. n.

Like *A. dorsalis*, but conspicuously smaller.

External appearance quite as in *A. dorsalis*, the colour as in the paler races of that animal. Fur coarse; hairs of back about 7 mm. in length. General colour of fore-back grizzled greyish buff, becoming more ochraceous posteriorly; under surface white, edged on each side with a pinkish-buff line. Ears and a spot above and below each eye ochraceous buff. Dorsal black line commencing between the ears and running to the root of the tail, the hairs on each side of it rather lighter than the general colour. Hands and feet light pinkish buff. Tail dark above, dull ochraceous laterally, dull buffy below.

Skull similar to that of *A. dorsalis*, but far smaller.

Dimensions of the type (measured in the flesh):—

Head and body 94 mm.; tail 115; hind foot 23; ear 15.

Skull: tip of nasals to hinder angle of frontals 20; nasals 9·7; interorbital breadth 4·6; palatal length 14·2; diastema 6·8; palatal foramina 6; length of upper molar series 4·6.

Hab. Gamon, French Gambia. Alt. 100′.

Type. Adult male. Original number A. 80. Collected 20th April, 1910, and presented by Mr. G. Fenwick Owen.

This is a pygmy W.-African representative of the southern *A. dorsalis*, but is so much smaller that it cannot be considered merely as a subspecies, especially as no member of the *dorsalis* group is known to occur in any of the vast area separating the two forms.

Arvicanthis dorsalis phæotis, subsp. n.

Like *A. d. maculosus*, Osg., but very much greyer, especially when viewed from behind, the ochraceous suffusion on the upper surface a much paler buffy except just on the rump. Ears at once distinguishable from those of *maculosus* and *rosalia* by their minute hairs being brown or greyish, not ochraceous, although the ochraceous tuft at the anterior base of the ears is still present. Light patches above and below eyes inconspicuous, buffy, not ochraceous.

Skull and teeth as in *maculosus*, equally larger than in *rosalia*.

Dimensions of the type (measured in flesh):—

Head and body 134 mm.; tail 144; hind foot 28; ear 18·3.

Skull: greatest length 34; breadth of brain-case 13·4; upper molar series 6.

Hab. Mazeras, coast region of British E. Africa. Alt. 500′.

Type. Old male. Original number 1238. Collected 10th July, 1910, by Robin Kemp, and presented by C. D. Rudd, Esq. Five specimens examined.

Compared with a series of *A. d. maculosus* from Voi, for which the Museum is also indebted to Mr. Rudd's collector, these specimens are much greyer, and are at once separable by their brown ears, these being as strongly ochraceous in *maculosus* as in the *A. d. rosalia* of German East Africa.

Epimys delectorum, sp. n.

A small soft-furred species, something like *E. morio.*

Size about as in *Apodemus sylvaticus.* Fur very soft, fine and silky; hairs of back about 9–10 mm. in length. General colour above dull sepia-brown, heavily blackened on the posterior back; sides tending more towards mummy-brown; under surface soiled buffy, the basal three-fourths of the hairs dark slaty, their tips and a fairly defined lateral line pinkish buff. Face dark greyish brown, the muzzle and an ill-defined orbital ring blackish. Ears large, dark brown. Hands and feet brown on the metapodials, silvery white on the digits and laterally. Tail almost naked, very finely scaled (16 rings to the centimetre), dark brown above and below, indistinctly marbled with lighter brown, its very sparse fine hairs brown above, whitish below.

Skull smooth, light and delicate, practically without ridges; supraorbital edges square, not beaded; projection of zygomatic plate medium; palatal foramina reaching back to the level of the front of m^1; bullæ of medium size.

Incisors narrow. Molars low-crowned and (in the single specimen) peculiar for the duplication, complete or partial, of the outer cusp of the first and second lamina of m^1 and of the main lamina of m^2, so that, viewed laterally, m^1 appears to possess five outer cusps—three larger ones and two smaller ones between them*. Lower molars (m_1 and m_2) each with a well-marked supplementary cusp at the outer end of the main transverse valley, and a median posterior supplementary ledge.

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* Cusps 3 and 6 of m^1 and 6 of m^2 in the notation employed by Mr. G. S. Miller.

Dimensions of the type (measured in flesh):—

Head and body 93 mm.; tail 120; hind foot 23; ear 20·5.

Skull: greatest length 27·5; basilar length 21; greatest breadth 12·5; nasals 11; interorbital breadth 4·5; breadth of brain-case 12; palatilar length 12·3; palatal foramina 5·8; upper molar series 4·4.

Hab. Mlanji Plateau, S. Nyasa. Alt. 5500′.

Type. Adult female. Original number 205. Collected 2nd May, 1910, by Mr. S. A. Neave. Presented by the Entomological Research Committee.

Apart from the peculiar characters of its molars, this mountain-mouse may be readily distinguished by its soft fur, dark colour, grey and buffy belly, parti-coloured feet, and nearly naked tail. It is, perhaps, most nearly related to *E. tullbergi* of W. Africa and *E. denniæ* of Ruwenzori; but in any case the relationship is very distant.

With regard to the teeth, I find a similar duplication of the outer cusp of the middle lamina of m^1 in a single example (B.M. no. 4. 7. 1. 109) of *E. tullbergi*, while other specimens have no trace of it. For this reason I reserve judgment as to the value of the character until further specimens of *E. delectorum* are obtained.

Uranomys oweni, sp. n.

A small West-African representative of the recently discovered *U. ruddi* of Mount Elgon.

General appearance more that of an *Acomys*, less that of a *Lophuromys*, than is the case with *U. ruddi*, but this may be partly due to the make of the skins. Fur crisp, not so stiff as in ordinary *Acomys*, more so than in *U. ruddi*; hairs of back about 11–12 mm. in length, a few longer hairs (13–14 mm.) intermixed with them. General colour very like that of many species of *Acomys*, between dull tawny and clay-colour; paler and more buffy on the sides. Under surface white, the hairs white to their bases; in *U. ruddi* they are grey basally. Ears finely haired, brown. Hands and feet white. Tail scaly, finely haired, very like that of an *Acomys*, brown above, whitish below.

Skull, apart from its much smaller size, very like that of *U. ruddi*.

Dimensions of the type (measured in flesh):—

Head and body 91 mm.; tail 66; hind foot 16·5; ear 14.

Skull: greatest length 26·2; basilar length 22·2; greatest breadth 13·6; nasals 8; interorbital breadth 4·5; breadth of brain-case 11; palatilar length 13·5; palatal foramina 7·3; upper molar series 4·7.

Hab. Marakissa, French Guinea.

Type. Adult male. Original number B. 25. Collected 30th May, 1910, and presented by G. Fenwick Owen, Esq., in whose honour the species is named.

This interesting species, the second known of its genus, greatly extends the range of *Uranomys*, as the first species, *U. ruddi*, was found on Mount Elgon, British East Africa.

The external resemblance of *U. oweni* to an *Acomys* is very striking, and a study of the skulls indicates that it is to that genus that *Uranomys* is most nearly allied, the peculiar structure of the posterior palate being very much the same in both. The shape of the brain-case, however, is very different, while in the unusual throwing forwards of the incisors *Uranomys* differs as much from *Acomys* as it does from other African Muridæ.

XLVIII.—*New Neotropical* Geometridæ. By Louis B. Prout, F.E.S.

[Continued from p. 333.]

Eupithecia longibasalis, sp. n.

♂. 18–19 mm.—Head, thorax, and abdomen ochreous varied with brown, face paler; the abdomen with a brown dorsal belt on second segment, and small blackish dorsal dots on succeeding segments; the crests very ill-developed. Fore wing ochreous suffused with pale brown, darkened in parts with fuscous; the lines angled below SC, then oblique and parallel; the darker basal area with its outer angle in cell reaching middle of wing and including the oblique linear black cell-mark; median area edged inwardly by a whitish-ochreous band with dark central line (the proximal half of the band the clearer whitish) and outwardly by a simple ochreous line, its proximal two-thirds marked with blackish along the veins; the pale subterminal line irregularly crenulate, preceded by patches of fuscous-black scales, met by a pale streak from apex, above which the costa is rather darker; terminal line thick, black, interrupted at the veins by pale spots; fringe pale, chequered with olive-grey in basal half. Hind wing whitish ochreous, darker along abdominal margin; the lines dark, but marked only on abdominal margin. Underside ochreous, in fore wing grey-suffused along costa and termen, where the lines and shades are clear; in hind wing with the lines thick and complete across wing; both wings with black cell-spots and the veins blackish.

Torné, Colombia, August 1907; three ♂ ♂. I have also seen a ♀ from San Antonio, W. Colombia, December 1907.

Eupithecia cabria, ab. (?) *pallidiplaga*, nov.

♂. 28 mm.—Head, thorax, and abdomen dull grey-brown; vertex of head and venter pale. Fore wing dull purplish grey tinged with rufous and olive in basal, costal, and terminal areas, inner margin below SM^2 and veins towards termen rufous brown; postmedian area occupied by a diffuse whitish patch; cell-spot large, black, and rounded; the usual cross-lines, angled below SC, are traceable across wing; subterminal line marked by black white-tipped points between veins; terminal line black interrupted by pale spots at the vein-ends; fringe with a bright pale line at base. Hind wing whitish without markings, except along abdominal margin, as far as M and M^2, where the ground-colour is tinged with rufous and the lines and shades are complete, including a fuscous blotch near base; along termen the rufous shade is more extended, and there are black terminal dashes between the veins, as far as R^1; cell-dot smaller. Underside of fore wing blurred grey, darker along costa, where the beginning of the lines is visible; of hind wing whitish speckled with fuscous, the lines indicated by dark vein-dashes.

Torné, Colombia, August 1907; one ♂.

In the absence of certainty as to the standing of this form, I have given an independent description of it; but Mr. Warren believes it to be "one of the variant forms" of *E. cabria*, Dogn. Ann. Soc. Ent. Belg. xliii. p. 141, and I accept this as very probable, though it is considerably larger and more sombre, and with the white more extended, than in Dognin's typical form.

Scordylia rufifimbria (Dogn.), ab. (?) *angustimargo*, nov.

♂. 28 mm.—Differs from typical *rufifimbria*, Dogn. Ann. Soc. Ent. Belg. xlvii. p. 272 (*Heterusia*), in the following points: the white blotch of fore wing is flattened and limited above by the median vein, instead of being rounded and reaching subcostal; its inner edge is oblique, the space between it and costa to near the end of cell being greenish fuscous, while its outer edge projects somewhat angularly outwards above SM^2; the costal spot at two-thirds is yellowish, and the spots between the radials white, with no trace of an intermediate pale spot; in the hind wing the dark border is not more than half the width of that of *rufifimbria*. Underside: costa of fore wing buff for two-thirds; the two white spots between radials developed into a short white blotch, separated from the buff costal spot by a patch of red and white striæ and touching below a lengthened leaden-grey submarginal patch; in the hind wing the narrow border is broken up by the white ground-colour and marked with deep red striæ only. Abdomen dorsally black in basal half, brown in anal, ventrally white.

Huancabamba, N.E. Peru; one ♂.

If not specifically distinct, at least likely to prove a good local form. Typical *rufifimbria* is known from Cuzco and La Merced, Peru, and from Yungas de la Paz, Bolivia, but not, so far as I am aware, from Huancabamba.

Subfam. *GEOMETRINÆ.*

(*Boarmiinæ*, &c., auctt.)

Narragodes lilacina, sp. n.

♂ ♀. 22–24 mm.—Head, thorax, and abdomen lilac-grey; face brown. Fore wing lilac-grey, the lines and the space between median and postmedian lines dull reddish brown, varying somewhat in different specimens; the lines vertical and strongly waved; antemedian at one-fourth, median just before middle; postmedian at three-fourths, but starting at little beyond two-thirds costa and angled on R^1; a dark cell-spot just before median line; an obscurely darker submarginal shade; terminal line finely black, interrupted on the veins; fringe lilac-grey. Hind wing without the antemedian line. Underside of fore wing ochreous, densely striated with purplish fuscous, the marginal border dark purplish fuscous, with straight inner edge, before which the ochreous ground-colour is less striated; of hind wing similar, with traces of two dark curved lines; fore wing with dark cell-spot.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂, two ♀ ♀ (one ♀ = type). Mr. Warren tells me he has also seen three ♀ ♀ from Tinguri, Carabaya, Peru, 3400 feet, August 1904.

Differs a little in aspect from typical *Narragodes*, but agrees in essential structure. The venation is somewhat variable; $SC^{1\cdot2}$ are always coincident, but they may be either shortly connected with C (1 ♂, 1 ♀) or anastomosing (1 ♀) and may either be free from SC^{3-4} or connected therewith; in the hind wing SC^2-R^1 may be either stalked (the type ♀) or connate (one ♀) or even coincident throughout (the only known ♂).

Microxydia ruficomma, sp. n.

♂. 21-24 mm.—Face and vertex white. Palpus and antenna ochreous, occiput and collar bright ferruginous; front of thorax bright ochreous; the rest of thorax and the abdomen cream-colour, base of the latter marked dorsally with pale ochreous, followed by a large spot of bright ferruginous, and this again by some much smaller ferruginous marking. Fore wing cream-colour, finely irrorated with ochreous, and with a few scattered dark scales; costa, termen, and fringe bright deep ferruginous, a thick blackish line at base of fringe; the lines ochreous, rather thick, but indistinct, at about one third and two thirds; antemedian starting from a ferruginous mark from costa, somewhat bent in cell; postmedian from a thick, comma-shaped, ferruginous mark at costa, which contains a smaller blackish comma, an angle on R^1 at which the ferruginous mark abruptly terminates, but there is a smaller one on the line at inner margin; cell-spot elongate, pale ochreous. Hind wing without ferruginous costa or costal markings, otherwise the postmedian line and termen as in fore wing; antemedian wanting; cell-spot weak. Underside similar, cell more clouded with ochreous, cell spots distinct, dull ferruginous, lines on fore wing obsolescent, that of hind wing spotted with ferruginous on the veins.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); three ♂♂. Also Candelaria Mountains, Costa Rica (*Underwood*), three ♂♂ in Coll. Brit. Mus.; Volcan de Chiriqui, Panama, 2000–3000 feet (*Champion*), one ♂ in Coll. Brit. Mus. The Central American specimens rather smaller than the Colombian.

Nearest to *M. rufifimbriata*, Warr. Nov. Zool. xi. p. 575.

Microxydia strigosa adoxa, subsp. n.

♂. 21–23 mm.—Differs from the typical (Peruvian) race of *M. strigosa*, Warr. Nov. Zool. xi. p. 576, in being paler, the ochreous speckling much less, and in having the postmedian line of both wings further from the termen, that of the fore wing therefore more approximated to the antemedian;

that of the hind wing is more nearly (though not entirely) parallel with the termen than in typical *strigosa*, the difference of position therefore more pronounced at inner margin than at costa.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); three ♂♂.

Microxydia trigonifera, sp. n.

♂. 22 mm.—Face and vertex white; palpus, antenna, and back of head ochreous; thorax and abdomen pale cream-colour. Wings pale cream-colour, speckled with ochreous; the lines very faint, ochreous-tinted; fore wing with antemedian strongly bent in cell, postmedian arising from a small triangular red subapical spot, very slightly incurved, reaching inner margin just beyond two-thirds; a similar faint ochreous-tinted discal mark; hind wing very little paler than fore wing, with postmedian only, no cell-mark; fringe of both wings strongly tinged with fulvous in distal half. Underside of fore wing suffused with reddish basally and especially at costa; cell-spot distinct, dark, elongate; postmedian line and subapical triangle nearly as above; underside of hind wing unmarked; fringes of both wings as above.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*), one ♂ (type); El Congo, Colombia, June 1907, one ♂.

Recalls, in some respects, *M. fulvicollis*, Warr. Nov. Zool. xi. p. 161, but in that species the coloration is deeper, the costal mark larger and the hind wing white.

Perusia parallela, sp. n.

♂ ♀. 28–32 mm.—Head, thorax, and abdomen concolorous with wings, the head and thorax of the ♂ slightly more tinged with rufous. Fore wing shining pale yellow, with numerous pearl-grey delicate transverse striæ, visible only in certain lights; costa pale yellow dotted with ferruginous red; the two lines parallel, grey tinged with ochreous; first vertical, a little before middle, rather faint; outer broader and edged distally with paler, from costa shortly before apex to inner margin close to tornus; fringe concolorous, with the base faintly rufous. Hind wing still paler yellow, without striæ or lines. Underside of fore wing with costa yellow striated with reddish; a square red spot just beyond outer line.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*) ; one ♂, one ♀.

Leuciris beneciliata, sp. n.

♂. 24–25 mm.—Closely akin to *L. fimbriaria* (Stoll) = *imperata* (Guen.), differing as follows: antennal cilia unusually long, about twice as long as in that species; fore wing with apex somewhat more acute, and with three distinct series of transverse dots on the veins and submedian fold, equidistant and parallel with termen, the median reaching only from M to inner margin, the postmedian outcurved below costa and slightly incurved at R^3 and M^2; hind wing with two similar equidistant series, the proximal sometimes incomplete. Coloration of the margins, of the head, legs, &c., as in *L. fimbriaria*.

Torné, Colombia, August 1907 (type), also four other males, July to August 1907.

Argyrotome tenebrosa extrema, subsp. n.

♂. 38 mm.—Differs from typical *Argyrotome tenebrosa*, Warr. Nov. Zool. iv. p. 460, from Bolivia and Peru, as follows: coloration even somewhat darker, especially of the hind wing and the marginal band on the underside; submarginal metallic bands thicker, that on the fore wing not preceded by distinct darker marks at R^3 and the medians, that on the hind wing straighter, running from apex to termen at the end of M^3, widening posteriorly and almost entirely absorbing the fourth metallic spot (that between M^1 and M^3), which is well free in typical *tenebrosa*; underside with the marginal bands broader.

Rio Bitaco, W. Colombia, 4400 feet, April 1908 (wet season); two ♂♂.

I have seen other examples, and believe the differences will prove constant, though probably not fully specific. The average size seems slightly larger, and the termen of the hind wing is very slightly prominent between R^3 and M^1, not quite evenly rounded as in the type form.

Opisthoxia omphale, sp. n.

♂. 34 mm.—Face and upper side of palpus ochreous brown; palpus beneath mixed with greyish, at base white; thorax light dove-colour, white in front and beneath; abdomen at base ochreous brown; otherwise dove-colour, venter paler. Fore wing red brown, the costa narrowly ochreous, then with a broad, narrowing white streak, which sends out slight excrescences into the ground-colour before one-half and again at two-thirds, and terminates in a point shortly before apex; a pure white inner-marginal streak, commencing in a point at before one-third, gradually widening, and reaching from tornus to M^2 at termen; base somewhat suffused with light silvery, merging into the white costal streak; an indistinct grey postmedian line as in *claudiaria*, Schaus, Tr. Am. Ent. Soc. xxvii. p. 165 (not mentioned in Schaus's description), no trace of an antemedian; fringe greyish red-brown, at extreme apex and towards tornus on inner margin ochreous. Hind wing reddish brown, somewhat more purple-tinted than fore wing; extreme base red-brown, brighter than in fore wing; a subbasal white stripe, broadening on costa, followed by an ochreous shade except at inner margin; a vague diffuse band of iridescent silvery scales from SC^2 beyond middle of wing to inner margin near tornus, curved in its posterior part; some similar scales along inner margin; a rather large, round, embossed metallic spot of about the same size, colour, and position as in *pepita*, Dogn. Ann. Soc. Ent. Belg. xl. p. 144 (*Ophthalmophora*), and a second, smaller spot on termen, also as in that species; terminal line bright silvery, broader and less sharply defined in posterior half, accompanied proximally by a very narrow ochreous line in anterior half; anterior half of fringe very pale ochreous, posterior deep dull ochreous; inner-marginal fold and fringe dirty white. Underside dirty white, fore wing with a rather broad terminal band and the fringe smoky.

Chanchamayo, Perú; one ♂.

Similar to *O. claudiaria*, Schaus (=*fosteri*, Warr. Nov. Zool. xvi. p. 99, nov. syn.), from Brazil and Paraguay, but differing in somewhat darker colour, the hind wing more purplish (in *claudiaria* more ochreous), in having somewhat broader costal and much broader inner-marginal white streaks, larger embossed spot on hind wing, *and a second spot at termen*, and in having the marginal silvery line *terminal*, whereas in *claudiaria* it is *subterminal*. Moreover, the second segment of abdomen is only very narrowly and indistinctly pale, while in *claudiaria* there is a very distinct pure white transverse bar.

Trigrammia (?) *subpurpurea*, sp. n.

♂ ♀. 30–32 mm.—Head, thorax, abdomen, and wings deep purplish brown, with numerous scattered whitish scales.

Fore wing with the costal edge dotted with deep orange; the lines deep chocolate-brown, equidistant; antemedian slightly curved; median oblique to middle, then nearly vertical (sometimes incurved); postmedian lunulate-dentate; subterminal indicated by a deep brown shade preceding it, conspicuous below R^3 as a snow-white curved mark, and followed distally by some white speckling; terminal line slender, dark; fringe concolorous. Hind wing with two lines only and no white submarginal markings. Underside slate-colour, merging into purple-brown at termen, lines of fore wing indistinct; costa clearly orange; hind wing paler, with two distinct dark lines.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); type (♀) and others.

Fore wing with SC^{1-2} coincident; hind wing with the termen not at all elbowed.

Callipseustes reflexa, sp. n.

♂. 26–28 mm.—Face, head, thorax, and abdomen light brown, finely irrorated with blackish. Fore wing with the angle at extremity of R^3 pronounced, a marked sinus between this and apex; light brown, with some darker striation, and shaded with olive in basal and distal areas, with pinkish on either side of the central fascia; the lines very fine, white, enclosing a rich, dark red-brown median area; first line from costa at about one-third to inner margin at beyond two-fifths, weakly sinuate; second line from costa at about one-half, oblique outwards to R^3, then sharply bent backwards, sinuate and reaching inner margin at scarcely more than 1 mm. from first line; two black marks near termen between the radials, the anterior elongate and followed by some weak dark shading in the terminal angle, the posterior smaller; terminal line weak, fringe weakly dark-spotted at the vein-ends. Hind wing much paler, darkened only in the inner-marginal and tornal region and sometimes along the termen; a dark fuscous line commencing obliquely from inner margin at before two-thirds, slightly curving away from base on approaching M^1, and vanishing before reaching R^1; a very indistinct grey cell-spot. Underside somewhat darker reddish brown; fore wing grey-clouded in basal half, narrowly pale along inner margin from base, broadly so in distal half of wing, where the pale shading reaches about to R^3; a fine dentate whitish line, filled in with dark grey, from costa about 4 mm. before apex, oblique distad to R^2 or R^3, there bent and becoming obsolescent; a dark cell-spot;

hind wing beneath with a large black cell-spot and a subterminal line, parallel with termen, composed of paired vein-dots, the proximal black, the distal white.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*), type and a second ♂; Torné, Colombia, August 1907, one ♂. I have seen other examples.

Distinguished by the triangular shape of the central band. *C. peninsulata*, ab. (bon. sp.?) *continens*, Warr. Nov. Zool. xiv. p. 286, comes nearest to it, but has more markings in the distal area of fore wing, the angle in termen less strong, &c.

[To be continued.]

BIBLIOGRAPHICAL NOTICE.

Catalogue of the Indian Decapod Crustacea in the Collection of the Indian Museum.—Part I. *Brachyura.* Fasciculus II. *The Indian Freshwater Crabs*—Potamonidæ. By A. Alcock, C.I.E., M.B., LL.D., F.R.S., &c. Calcutta, 1910.

The freshwater crabs of the family Potamonidæ are of special interest to the student of geographical distribution, but, like many other groups of freshwater animals, they offer peculiar difficulties to the systematist. In this memoir Lt.-Col. Alcock not only provides exact and detailed descriptions of all the forms (including many new species and varieties) found within the limits of British India, but also gives an entirely new aspect to the classification of the family by calling attention to some important structural characters, hitherto overlooked, which seem to afford a satisfactory basis for the delimitation of subfamilies and genera. He discusses the distribution of the Indian species, pointing out that while "Blanford's zoological subdivisions of the Indian Empire, which are based on the present distribution of vertebrates, suit the Potamonidæ in a general way . . . that author's physical subdivisions of the area have, as a rule, a much more exact correspondence with the tracts in which the constituent groups of the family are concentrated." The memoir is distinguished by those qualities of lucidity, insight, and breadth of view which students of the Decapod Crustacea have learned to expect in the writings of the former Superintendent of the Indian Museum.

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 35. NOVEMBER 1910

XLIX.—*Descriptions of new Species of Heterocera from New Guinea.* By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

Arctiadæ.

BLAVIODES, gen. nov.

Antennæ bipectinate to the tip and with cilia, tibiæ with spurs. Second segment of abdomen raised into a ridge on the dorsum, from which arise tufts of long hair. Neuration: vein 5 absent in both wings. Primaries: 2 from cell, 3 and 4 stalked, 6 from cell; 7, 8, and 9 stalked; 10 free from cell; 11 arising from behind the middle of cell (*i. e.* nearer base) and anastomosing shortly with 12. Secondaries with 4 and 5 absent; 2 and 3 arising separately from cell; 6 and 7 strongly bent from the angle of the cell; 8 anastomosing shortly at the base with 7, long.

Type, *Blaviodes ochracea*, B-B.

Blaviodes ochracea, sp. n.

♂. Head, antennæ, and thorax dull ochreous; abdomen grey, with ochreous anal segment. Primaries uniform dull ochreous, shading into greyish at the termen. Secondaries grey, creamy ochreous on the costa and aborted part of the cell.

Expanse 22–24 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Chionœma nigroplagata, sp. n.

♂. Head and thorax whitish, the latter with dark grey collar and patagia: abdomen whitish. Primaries with costa dark grey; a small white spot at the base and two near the centre, apex also white; cell dirty grey-white below and beyond up to the termen; an irregular dark grey patch near the centre of the inner margin, with a diamond-shaped outline in dark grey above it; a large dark grey patch beyond this in the postmedian area; terminal area broadly white, termen itself spotted with dark grey, decreasing in size towards the tornus. Secondaries clear creamy white.

Expanse 28 mm.

Hab. Mount Kebea, British New Guinea, 6000 feet; March to April.

Type in my collection.

Near *C. melanoplagia*, Hmpsn.

Chionœma inusitata, sp. n.

♂. Head, thorax, and abdomen creamy grey, the latter with the median segments dark grey. Primaries creamy grey, with a broad median darker grey band, the central part of which is obsolete; postmedian and terminal areas darker grey, with an angulated creamy-grey stripe dividing it from the former and terminating in the tornus; an obscure small pale spot is on the inner margin in the postmedian area. Secondaries with the basal half creamy white, the terminal part being grey.

♀. Head, thorax, and abdomen grey, head and thorax with a central creamy stripe. Primaries like the male in general pattern, but much darker and whiter—thus the base and postmedian areas are white and very irregular, the median area is very broadly dark grey, irregular, with two sharp serrations externally and two white spots in the middle; postmedian and terminal areas as in the male, but the grey is quite dark and the light lines are white. Secondaries uniform pale grey.

Expanse, ♂ 32, ♀ 34 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Types in Coll. Kenrick.

Asura decussa, sp. n.

♂. Head and thorax yellowish. Primaries pale pinkish yellow, deepening into pinkish towards the termen; a brownish X-shaped mark across the median area from costa to inner margin, with a broad postmedian paler > mark joining its two external extremities; costa very finely dark, fringes dark. Secondaries pale semitransparent yellow.

Expanse 24 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Diacrisia styx, sp. n.

♂. Palpi and antennæ black, head and thorax orange-red; abdomen black, with a latoral orange-red line. Both wings black: primaries with the veins finely whitish; a white irregular spot below the angle of vein 2, and a broad, curved, white subapical band from costa to termen, leaving the apex black. Secondaries uniformly black. Fringes black to both wings.

Expanse 44 mm.

Hab. Ninay Valley (Arfak Mountains), 3600 feet.

Type in my collection.

Noctuidæ.

PILIPECTUS, gen. nov.

Eyes smooth; palpi upturned, second and end segment long, the latter nearly naked; antennæ simple; thorax, patagia with raised, longish, spatulate scales and tufts of very long bristle-like hairs. Legs long, thin, mid pair with a pair of long tibial spines; hind legs with two pairs of long spurs, one pair being midway between the femoral and tarsal sockets. Neuration: primaries with vein 2 from near middle of cell, 4 from the lower angle, 5 from above the angle, 6 from the upper angle, 8 and 9 on a long stalk from 10 anastomosing with 7 to form the areole, 11 from behind the middle of cell. Secondaries with 3 and 4 from the lower angle, 5 from just above the angle, 6 and 7 from the upper angle.

Type, *Pilipectus ocellatus*, B-B.

Pilipectus ocellatus, sp. n.

♂. Frons greyish brown; caput cream-colour; collar mauve-brown, tipped with cream; thorax brown, patagia with scales chestnut-grey, tipped with dark chestnut-brown, with creamy long bristles like hairs; abdomen grey. Primaries greyish white, so closely striated with chestnut-grey that only fine lines of the ground-colour show; two round occellations following each other and touching beyond the cell of a deep crimson, with pupils of bright orange and pale mauve; below the cell a crimson-brown mark divided by vein 1 *b*, and a similar coloured lunule in the tornus; apex pale tawny. Secondaries white, with apex broadly dark grey, rapidly tapering into a fine line along the termen.

Expanse 39 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Near *P. prunifera*, Swinh.

Ancara kebeæ olivescens, subsp. n.

♂. Similar in general pattern to *A. kebeæ*, but all the paler parts of the primaries (including both the stigmata) are filled in with a delicate olive-green, so that the base, much of the costa, the median area, and the terminal area are mostly of this colour; the thorax and head are also of the same hue.

Hab. Arfak Mountains, 4000 feet, February and March.

Type in Coll. Kenrick.

This form apparently replaces *A. kebeæ*, B-B., in the Arfak Mountains.

Sesamia arfaki, sp. n.

♀. Head, thorax, and abdomen brownish grey. Primaries pale greyish brown, sparingly and very finely irrorated along the costal and inner marginal areas with very minute darker scales; a dark stripe along the lower margin of the cell and slightly extending along veins 2 to 5; a trace of a curved crenulate very fine postmedian line. Secondaries uniform very pale grey.

Expanse 53 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Sarrothripa costiplagata, sp. n.

♀. Head and thorax grey, the latter spotted with black; abdomen grey. Primaries greenish grey, whitish along the costa; a black basal costal dot, two black patches on the costa, from the median one a very oblique dark stripe extends nearly to the tornus, and from the postmedian one a black, palely edged, irregular dentate line descends to meet the oblique stripe; beyond this is a similar subterminal line arising in a small black costal spot, apex black confluent with this line; termen finely black, with interneural black serrations; the basal area has slight darker patches, and from the black stripe a fine, black, irregular median line descends to the inner margin. Secondaries whitish grey at base, becoming darkish grey at the termen.

Expanse 22 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Near *S. mesoplaga*, Hmpsn.

Batracharta walkeri, sp. n.

♂. Head and thorax chocolate-brown; abdomen creamy grey. Primaries chocolate-grey over the base and very broadly and irregularly along three-quarters of the costa; the submedian, most of the postmedian, and the terminal areas cream-colour, very closely striated and irrorated with tawny rufous; an irregular subterminal line of chocolate-brown; termen narrowly chocolate. Secondaries creamy pale yellow.

Expanse 48 mm.

Hab. Ninay Valley, Arfak Mountains, 3600 feet.

Type in my collection.

Near *B. obliqua*, Wlk.

Ophiusa arfaki, sp. n.

♂. Head pinkish grey, thorax and collar pale tawny brown, patagia pale grey, abdomen yellow. Primaries pinkish grey, deepening below and beyond the cell into reddish-tawny pale brown; the orbicular represented by a dark dot, the reniform darkly encircled and filled in with a sublustrous leaden hue; an oblique, strongly serrated, dark red subterminal stripe from the apex to the inner margin and a trace of an oblique waved postmedian line. Secondaries clear markless chrome-yellow.

Expanse 84 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Near *O. sublutea* and *kenricki*, B-B.

Egnasia fulvivenis, sp. n.

♂. Head, thorax, and abdomen dull ochreous brown. Primaries ochreous brown, with dark brown lines and all the veins finely dark brown; a short basal line, followed by an obtusely angled antemedian line, beyond this the median area is paler up to the very irregular median line, which is followed by a second almost parallel median line; postmedian line more strongly accentuated, very deeply angled outwards; above the tip of the angle is a pale grey patch reaching nearly to the apex of the wing; subterminal line irregular, somewhat crenulate, edged internally with pale grey in continuation of the pale grey patch; termen finely dark brown, preceded by a row of dark brown points. Secondaries ochreous grey, with the postmedian dark line distinct; a trace of a crenulate subterminal line; termen finely dark, preceded by a row of dark brown points; termen of both wings crenulate.

Expanse 34 mm.

Hab. Ninay Valley, Arfak Mountains.

Type in my collection.

Lymantriadæ.

Euproctis arfaki, sp. n.

♂. Head, thorax, and antennæ pale brown; abdomen black, terminal segment whitish. Primaries very pale uniform brown, sparingly suffused with fine darker brown scales. Secondaries uniform clear chrome-yellow.

Expanse 40 mm.

Hab. Arfak Mountains, 4000 feet; February to March.

Type in Coll. Kenrick.

Euproctis rubida, sp. n.

♂. Head and thorax bright reddish orange; abdomen black, proximal and terminal segment yellowish. Primaries uniform reddish orange, without any marks. Secondaries uniform clear lemon-yellow.

Expanse 38 mm.

Hab. Arfak Mountains, 4000 feet; February to March.

Type in Coll. Kenrick.

Euproctis lavella, sp. n.

♂. Head and thorax pale lemon-yellow; abdomen greyish, with terminal segments dark grey, fringed with pale lemon-yellow. Primaries very pale lemon-yellow, basal area deeper in tone; a pale median and postmedian line angulated about the cell, the interspace filled in with rather deeper yellow.

Secondaries whitish, tinged with yellow, with the inner margin slightly grey.

♀. Head and thorax orange-yellow; abdomen all darkish grey. Primaries uniform orange-yellow. Secondaries yellowish, with the area to beyond the cell darkish grey.

Expanse, ♂ 30, ♀ 34 mm.

Hab. Vella Lavella (Solomon Isles); February and March.

Type in my collection.

Allied to *E. varians*, but the abdomen is dark and the lines differ, whilst the female differs altogether.

Lymantria ninayi, sp. n.

Head white, collar finely black, thorax white; legs white, edged with bright crimson and black; abdomen black. Primaries with basal area to end of cell and nearly to tornus pure white, rest of wings dark grey; veins yellow, a black basal bar from cell to costa, followed by a short compressed series of four blackish spots in the same area, which is again succeeded by an angulated black mark on the costa, a very deeply serrate black postmedian line with a lighter edge, followed by a much suffused and broader black stripe equally serrate; termen spotted with black between the veins. Secondaries pure white with terminal quarter black, the apex being more broadly black, inner margin narrowly black.

Expanse 39 mm.

Hab. Ninay Valley (Arfak Mountains), 3600 feet.

Type in my collection.

Allied to *L. kebeæ*, B-B.

PELLUCENS, gen. nov.

Antennæ bipectinated to tip with long cilia, fore leg (in ♂) with a long hairy spine from tibial joint much longer than the tibia itself. Neuration: primaries, vein 2 from a third from the lower angle, 4 from the lower angle, 5 from the point of union with the discocellulars a little above 4, 6 from the upper angle, 7, 8, 9, and 10 stalked, 10 from nearly midway to the apex. Secondaries: 4 from the lower angle, 5 from near the lower angle, 6 and 7 from the upper angle; upper quarter of cell deeply recessed.

Type, *Pellucens lactea*, B-B.

Pellucens lactea, sp. n.

♂. Head white, antennæ black, thorax and abdomen creamy. Both wings milky white, with the termen broadly brown. Primaries with the costa very narrowly dark brown, the dark termen crenulate as to its inner margin, owing to the veins showing white through. Secondaries with veins showing white through the dark margin, which is crenulate on its inner edge.

Expanse 58 mm.

Hab. North coast of Dutch New Guinea.

Type in Coll. Kenrick.

Hypsidæ.

Deilemera hyalina, sp. n.

♂. Head tinged with yellow, with two central white spots (vertical), collar and thorax dirty white spotted with black; abdomen dark grey, with dirty white or yellowish segmental divisions. Primaries pale transparent brownish, with a broad white irregular oblique stripe at the end of the cell from costa to inner margin, a trace of a white dash on the fold. Secondaries transparent milky white, with a broad semitransparent brown border, veins showing white through.

Expanse 52 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Deilemera warmasina, sp. n.

♂. Head, thorax, and abdomen black, thorax with two yellow lines meeting in centre, abdomen with yellowish segmental divisions. Primaries blackish brown below the the cell, white to within a quarter from the tornus, a series of five ovate interneural spots beyond the cell, getting larger nearer the inner margin; a white spot in the cell at its end, above it a trace of a short white dash, and a white fine line in the cell; fringes white. Secondaries milky white with a broad fairly even blackish-brown termen; fringes white.

Expanse 40–46 mm.

Hab. Warmasin Lake, Arfak Mountains, 6000 feet; February.

Type in Coll. Kenrick.

Sphingidæ.

Oxyambulyx jordani, sp. n.

Head dove-grey with a broad golden-brown band between the antennæ; thorax dove-grey, with patagia and sides of thorax golden olive-brown, meeting on the metathorax; abdomen dove-grey, yellow on the ventral surface, with a slightly golden-brown patch on the dorsum of the two terminal segments. Primaries dove-grey, with an olive-grey subovate large spot on the costa near the base, and below this below the cell a trace of a small dark spot palely encircled, a double median dark line twice deeply indented, enclosing a somewhat dark area, an obscure crenulate double postmedian line also enclosing a somewhat darker area, apex and lower radial area olive-brown, the latter with a dark grey spot above vein 2, a subterminal broadish line of golden olive-brown edged internally with very pale grey; termen broadly olive-grey, edged internally by a very dark olive black-brown curved stripe. Secondaries: base pale grey with yellow showing through, a broadish irregular waved dark median line followed by a yellow band interrupted by the veins, beyond which the area is dark blackish brown to the termen, with a postmedian row of yellow spots; costa and apex broadly pale yellow.

Expanse 129 mm.

Hab. Arfak Mountains, Dutch New Guinea, 4000 feet; February and March.

Type in Coll. Kenrick.

Eupterotidæ.

Nervicompressa erectilinea, sp. n.

♂. Head, thorax, and abdomen rufous brown, abdomen with an orange tinge. Primaries pale ochreous brown, with a small pale spot darkly encircled in the cell near the base, an erect straight dark median line, beyond which the postmedian area is darker and terminates in a scalloped edge, apex also darker. Secondaries pale orange-brown, with a trace of a darker median and curved postmedian line.

Expanse 44 mm.

Hab. Ninay Valley, 3000 feet, Arfak Mountains, Dutch New Guinea.

Type in my collection.

PARAMARANE, gen. nov.

Head and thorax clothed with rough shortish hairs. Antennæ bipectinate. Legs hairy. Wings broad: primaries roughly triangular, rapidly expanding; secondaries fairly full. Neuration: primaries, vein 4 from the lower angle, 5 from the middle, 6 from the upper angle, 7, 8, and 9 stalked from nearer the apex, 10 absent. Secondaries with 4 from the lower angle, 5 from above the middle, 6 and 7 stalked.

Type, *Paramarane pulchra*, B-B.

Paramarane pulchra, sp. n.

♂. Head and thorax sooty black; abdomen ochreous yellow. Legs sooty black. Primaries silvery white, costa very finely yellow, fringes finely tipped with pale yellow, an oblique waved yellow postmedian stripe with a dark brown central finer line. Secondaries uniform golden-yellow.

Underside: both wings uniform golden yellow.

Expanse 51 mm.

Hab. Warmasin Lakes (Arfak Mountains), 6000 feet, Dutch New Guinea; February.

Type in Coll. Kenrick.

RARISQUAMOSA, gen. nov.

Antennæ with bristles and cilia. Wings: primaries broad, expanding rapidly outwards; secondaries of moderate width. Neuration: cell of moderate length; primaries with 4 from the lower angle, 5 from above the middle of the cell which is deeply recessed, 6, 7, 8, and 9 stalked, 10 absent, 11 from the cell. Secondaries: 4 from the angle, 5 from above the middle of the cell which is very deeply recessed, 6 and 7 stalked, 8 anastomosing shortly with 7 near the base of the cell. The primaries are but scantily clothed with scales and considerable areas are covered with fine bifurcate hair-like scales, often curled, which give the wings a semitransparent appearance.

Type, *Rarisquamosa arfaki*, B-B.

Rarisquamosa arfaki, sp. n.

♂. Head, antennæ, thorax, and abdomen dull rufous; legs same colour. Both wings rufous. Primaries with the median area broadly covered with fine grey bifurcate hair-like scales, a broadish rufous line across the end of the cell, an irregular terminal area of similar grey scales, the postmedian area between these grey areas clear rufous. Secondaries without any markings at all, but more scantily scaled at the base.

Expanse 49 mm.

Hab. Ninay Valley, Arfak Mountains, Dutch New Guinea, 3600 feet.

Type in my collection.

Hypercydas albaserrati, sp. n.

♀. Head, thorax, and abdomen deep orange-colour; antennæ and legs black. Both wings rufous, each with a subterminal lanceolate white stripe, veins slightly paler than ground up to the white stripe, a very obscure trace of a darker median line across the primaries only.

Expanse 66 mm.

Hab. Biagi, British New Guinea.

Type in my collection.

Nearly allied to *H. turneri*, B-B., but the shape of the subterminal line differs and it is white not yellow, and there is no spot in the cell as in that species.

Geometridæ.

Bordeta divergens, sp. n.

♀. Head and thorax black, collar deep cream-colour; abdomen: proximal segment entirely clear yellow, rest of abdomen clear yellow with a broad black dorsal stripe and a brown ventral stripe. Primaries black, with three deep cream spots, a large oblique one across the end of the cell, a smaller subcostal one midway between it and the apex, and a still smaller subterminal one between veins 3 and 4. Secondaries deep black with the whole of the central area orange from the base, extending to the inner margin and along vein 1 and well above the costal vein, gradually narrowing towards the termen, suddenly contracting on each side at a quarter from the termen, but at veins 3 to 5 the orange reaches nearly up to the termen.

Underside as the upper.

Expanse 60 mm.

Hab. Mount Kebea, British New Guinea, 3600 feet, July.

Type in my collection.

This species is near *fulvata*, but is no doubt distinct.

Bordeta flavoplagata, sp. n.

♀. Head black, collar yellow; thorax black; abdomen black with fine yellow intersections. Both wings black. Primaries with three yellow spots, an oval one at the end of the cell, a smaller subcostal one near the apex, and a smaller one below it near the termen. Secondaries with a large yellow area from vein 6 to 1 extending well beyond the cell, beyond this an irregular yellow spot between it and the termen.

Underside as the upper.

Expanse 54 mm.

Hab. Arfak Mountains, Dutch New Guinea, 4000 feet.

Type in Coll. Kenrick.

Eubordeta flammens, sp. n.

♂. Head and collar dark iridescent blue; thorax black; abdomen dark metallic blue. Both wings black with scarlet-red patches. Primaries with basal half (to about the end of the cell) scarlet-red. Secondaries with a large scarlet-red patch in the median area right up to the costa, leaving the base and inner margin narrowly and the termen broadly black.

Underside: primaries with the scarlet-red showing through and a large subapical yellow patch in the black area. Secondaries entirely yellow, with the termen and inner margin narrowly black, and a somewhat restricted scarlet blush over the yellow at the base.

Expanse 48 mm.

Hab. Warmasin Lakes, 6000 feet, Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

Eubordeta rubroplagata, sp. n.

♂. Head, thorax, and abdomen black. Both wings black with red patches. Primaries with a broad oblique red band right across the wing near the end of the cell. Secondaries with a subtriangular red patch by the apex.

Underside: primaries as above, with the addition of a transverse broadish yellow subapical dash. Secondaries black, with a short basal costal yellow dash, a yellow patch below the end of the cell, and a yellow streak above the end of the cell confluent with a broadish subterminal yellow curved stripe.

Expanse 48 mm.

Hab. Warmasin Lakes, 6000 feet, Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

Milionia rubristrigata, sp. n.

♂. Head, patagia, and abdomen bright metallic blue. Both wings black. Primaries with a restricted bright metallic-blue base followed across the middle of the cell by an oblique broadish red band, broadest on the fold, and extending right across the wing. Secondaries with the base to well beyond the end of the cell bright metallic blue, beyond this the black has in certain lights a blue tone.

Expanse 46 mm.

Hab. Momi (4000 feet), Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

Milionia callima, sp. n.

♂. Both wings velvety black. Primaries with the terminal quarter bluish black, a small brilliant metallic basal pale bluish-green patch restricted to the basal part of the cell but extending diagonally to the middle of the inner margin, a postmedian stripe of similar colour, indefinite as to margins, broadish at the costa and tapering towards the tornus. Secondaries with a very indefinite postmedian irregular area of sublustrous deep blue.

Underside: primaries with a broad pale metallic bluish-green transverse band across the end of the cell. Secondaries with a similarly coloured basal patch nearly up to the end of the cell.

Expanse 47 mm.

Hab. Momi, 4000 feet, Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

Milionia basiviridis, sp. n.

♂. Both wings velvety black. Primaries with a very restricted basal patch of pale metallic greenish, secondaries with a sublustrous blue dash in the cell.

Underside with the basal greenish patch larger, but only extending slightly below the cell.

Expanse 44 mm.

Hab. Momi, Arfak Mountains (4000 feet), Warmasin Lakes, 6000 feet, Dutch New Guinea.

Type in Coll. Kenrick.

Milionia keberai, sp. n.

♀. Both wings deep velvety black. Primaries with an oblique slightly curved even broadish brilliant median stripe of pale metallic bluish green. Secondaries with a similar green dot at the end of the cell.

Underside: primaries as above, but the stripe broader and shorter. Secondaries with a short green basal costal dash, and a narrow brilliant metallic curved short stripe crossing the end of the cell.

Expanse 47 mm.

Hab. Mount Keberai, 8000 feet, Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

I was at first inclined to think this might be the female of the previous species, but the underside is so totally different in the metallic markings that I conclude its male has not yet been received.

Milionia arfaki, sp. n.

♂. Head (vertex) and abdomen bronzy lustrous green. Both wings deep black with rosy-red bands. Primaries with a median broad red oblique stripe slightly curved, scarcely touching the costa, a broadish inner-marginal dash from beyond the base, scarcely touching the transverse stripe. Secondaries with a broad red band across the end of the cell.

Underside as above, but the red is replaced with orange.

♀. As the male, but the transverse stripes are nearer the termen and right across the wings in both primaries and secondaries, and the red is inclined to orange.

Expanse, ♂ 50, ♀ 51 mm.

Hab. Warmasin Lakes, 6000 feet, Arfak Mountains, Dutch New Guinea.

Types in Coll. Kenrick.

In some specimens the inner-marginal dash is quite isolated from the transverse band of the primaries, in others like the type it almost touches, whilst in one male it forms a broad continuous angulated stripe.

Milionia flavostriga, sp. n.

♀. Head and collar iridescent blue; thorax slightly tawny; abdomen bright pale metallic blue (not green). Both wings black with orange-yellow bands. Primaries with a broad orange-yellow oblique band from the costa nearly into the tornus across the end of the cell, a broad darker yellow patch from the base into the cell, whence it tapers off into the oblique band, thus making the whole of the inner margin yellow and leaving only a narrowish wedge-shaped black mark from the costa to vein 1. Secondaries with a broad postmedian orange-yellow band irregular as to its outer margin; basal area covered with tawny yellow scales.

Underside as the upperside, except that there is no yellow at all in the basal areas and that both these areas are metallic bright bluish.

Expanse 54 mm.

Hab. Warmasin Lakes, 6000 feet, Arfak Mountains, Dutch New Guinea.

Type in Coll. Kenrick.

Milionia subaurea, sp. n.

♀. Head, thorax, and proximal segment of abdomen dull black, rest of abdomen entirely dull yellowish. Primaries dull black with a broad postmedian oblique red band from the costa into the tornus, a black tooth intercepting it at the tornus. Secondaries black with the median area very broadly golden yellow up to the inner margin, thus leaving a very restricted black base and narrow black costa, but with the termen very broadly deep black, in which is a dull golden-yellow irregular small patch about vein 3.

Underside exactly as upperside.

Expanse 56 mm.

Hab. Ninay Valley (3600 feet), Arfak Mountains, Dutch New Guinea.

Type in my collection.

Milionia magna, sp. n.

♂. Head and thorax sooty black; abdomen sooty black, with the four anal segments yellow tipped on the dorsum with black bars. Both wings sooty black. Primaries with a very broad oblique white band across the end of the cell, bent inwardly about vein 2, this band extends right across the wing from the costa to the inner margin and has a distinct trace of red scaling at the latter point. Secondaries with a broad oblique red bar beyond the end of the cell from the inner margin to vein 6.

Underside as the upper.

Expanse 86 mm.

Hab. Ninay Valley (3600 feet), Arfak Mountains, Dutch New Guinea.

Type in my collection.

Soritia flaviplaga, sp. n.

♂. Head and thorax black; abdomen black, with yellow segmental divisions. Primaries black, with a bright yellow oblique postmedian band. Secondaries with the basal area bright yellow extending far beyond the cell in the lower radial area, leaving the apex and the tornus very broadly black and the outer margin less broadly black, especially in the lower radial area. Under surface similar to that above, but with the yellow parts larger, and in addition the apices of both wings have a steely-blue stripe.

Expanse 37 mm.

Hab. Aroa River; British New Guinea.

Type in my collection.

Psychidæ.

(*ÆCETIINÆ.*)

HYALINARIA, gen. nov.

Antennæ bipectinated to tips, abdomen long. Legs: fore tarsus with terminal joint long, no tibial spine. Mid femur large and dilated, tarsus with terminal joint longish; hind leg with femur very broad and much dilated, tarsus very short. Wings large and broad. Neuration: primaries with vein 6 from above the middle of the discocellulars, 7, 8, and 9 stalked (in one specimen vein 9 is absent in the left wing). Secondaries with vein 5 absent, 8 sending branches to the costa.

Type, *Hyalinaria fuscibasis*, B-B.

Hyalinaria fuscibasis, sp. n.

♂. Head, thorax, and abdomen clothed with lightish brown hairs. Both wings almost hyaline, base only clothed with lightish brown scales; secondaries for a more restricted area than the primaries; in the secondaries the abdominal fold has a scanty clothing of light brown hairs.

Expanse 50 mm.

Hab. Ninay Valley, Arfak Mountains, Dutch New Guinea.

Type in my collection.

Lasiocampidæ.

Pseudophyllodes nigrostrigata, sp. n.

♂. Head and thorax rufous, antennæ blackish with shaft black, abdomen rufous with broadish dark segmental divisions. Both wings deep rufous. Primaries with a broadish indefinite slightly curved black stripe from the base to the termen, through the cell and between veins 5 and 6, a very obscure trace of two parallel dark lines across the postmedian area. Fringes rufous. Secondaries with the portion of the wings below vein 6 more or less suffused with black, fringes white.

Expanse 56 mm.

Hab. Ninay Valley, Arfak Mountains, Dutch New Guinea, 3600 feet.

Type in my collection.

A near ally to *Pseudophyllodes rubiginea*, B-B.

Pseudophyllodes ninayi, sp. n.

♀. Head, antennæ, thorax, abdomen, and legs all pale ochreous grey. Both wings pale ochreous grey. Primaries with two darkish median lines, two postmedian, and one subterminal line, all strongly crenulate, a dark spot at the end of the cell, apical quarter of wing to about vein 5 pale rufous. Secondaries with a broad curved darker band, beyond which the ground-colour is more ochreous.

Expanse 53 mm.

Hab. Ninay Valley, Arfak Mountains, 3600 feet.

Type in my collection.

I place this species temporarily in this genus, though it may turn out to belong to another when the male sex is discovered.

Limacodidæ.

Mambara dubia, sp. n.

♂. Head, thorax, abdomen, and both wings pale pinkish ochreous grey. Primaries with the least trace of a fine darker median line and a fine dark curved postmedian line. Secondaries without any mark at all.

Expanse 19 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

Near to *M. inconspicua*, B-B., but a decidedly smaller species, and the median and postmedian line both differ in shape and position, the latter ending further away from the tornus.

Mambara pallens, sp. n.

♂. Head, thorax, and abdomen pale pinkish brown. Both wings pale ochreous grey. Primaries with an obscure median strongly dentate fine line; fringes slightly darker with a pinkish tinge. Secondaries slightly darker than primaries, with a pinkish tinge quite markless.

Expanse 20 mm.

Hab. Arfak Mountains, 4000 ft.; February and March.

Type in Coll. Kenrick.

Hepialidæ.

Œnetus arfaki, sp. n.

♂. Head and thorax brown; abdomen pinkish ochreous, brown on the terminal segments. Primaries pale yellowish green, with three small rufous spots near the middle of the costa and a larger rufous patch near the tornus on the inner margin, a silvery-white spot below the middle of the cell, a similar one below vein 2 and two above this latter spot at vein 5—one on each side of it. Secondaries pinkish cream-colour.

Expanse 71 mm.

Hab. Arfak Mountains, 4000 feet; February and March.

Type in Coll. Kenrick.

L.—*Descriptions of Six new European Mammals.*

By Gerrit S. Miller.

Of the six new mammals here described four are in the collection of the British Museum, the two others have been kindly placed at my disposal by Dr. Knud Andersen and Mr. Angel Cabrera.

Sorex araneus granarius, subsp. n.

Type.—Adult male (in spirit). B.M. no. 6. 11. 4. 4. Collected at La Granja, Segovia, Spain, by M. de la Escalera.

Characters.—Smallest known European race of *Sorex araneus*, the condylo-basal length of skull only about 17·5 mm., upper tooth-row about 7·5 mm.; palate wide in front as in *S. araneus fretalis*, but anterior teeth not enlarged.

Measurements.—Type (adult male) and an older male, also from La Granja. Head and body 62 and 66 mm.; tail 36 and 37; hind foot 11·6 and 11·6; ear from meatus 6·6 and 7; condylo-basal length of skull 17·6 and 17·4; breadth of brain-case 9·0 and 9·2; mandible 9·0 and 9·0; maxillary tooth-row (entire) 7·6 and 7·4; mandibular tooth-row (entire) 7·0 and 6·8.

Specimens examined.—Two, both from the type locality.

Remarks.—The discovery of this animal is of unusual interest, as there has hitherto been no authentic record of the occurrence of a member of the genus *Sorex* in the Iberian Peninsula.

Dyromys robustus, sp. n.

Type.—Adult female (in spirit). Collected at Rustchuk, Bulgaria, by K. Andersen.

Characters.—Like *Dyromys nitedula*, but skull broader and more robust, with relatively shorter rostrum and much enlarged audital bullæ.

Measurements.—Head and body 95 mm.; tail 87; hind foot 22; ear from meatus 15; condylo-basal length of skull 25·6; zygomatic breadth 16·8; mastoid breadth 13·6; mandible 15·2; maxillary tooth-row (alveoli) 3·8; mandibular tooth-row 4·2 (teeth slightly worn).

Specimen examined.—The type.

Remarks.—In its peculiar broad robust skull, relatively short rostrum, and enlarged audital bullæ this animal differs from all the hitherto known European races of *D. nitedula* as well as from the Asiatic members of the genus.

Microtus dentatus, sp. n.

Type.—Adult female (skin and skull). Collected at Molinicos, Sierra de Segura, Albacete, Spain, December 11, 1908.

Characters.—Similar to *Microtus cabreræ*, Thomas, of Central Spain, but larger, the skull about 30 mm. in condylo-basal length; teeth excessively heavy, larger than in any other known European *Microtus*, the maxillary tooth-row 8 mm. in length; m_3 with completely closed triangle on outer side; colour paler and less buffy. (Ground-colour of back and sides less yellow than the cream-buff of Ridgway, the general effect a peculiar buffy grey, noticeably different from the olive or bistre of *M. cabreræ*; underparts light grey, scarcely tinged with buff.)

Measurements.—Type. Head and body 125 mm.; tail 40; hind foot (dry) 22; upper length of skull 29·4 (in type of *cabreræ* 26·6); condylo-basal length 30 ± (in type of *cabreræ* 27·0); mandible 19·0; maxillary tooth-row (alveoli) 8·0; mandibular tooth-row 7·6.

Specimen examined.—The type.

Remarks.—I owe to the kindness of Mr. A. Cabrera the opportunity of examining the type and only known specimen of this species. The animal is evidently related to *Microtus cabreræ*, but its unusually large molars immediately distinguish it among the European members of the genus. The presence of a completely closed triangle in the posterior lower molar is equally unusual.

Pitymys atticus, sp. n.

Type.—Adult female (skin and skull). B.M. no. 8.10.2.51. Collected at Kephissia, near Athens, Greece, June 30, 1908, by Chas. Mottaz. Original number 6113.

Characters.—Size much less than in *Pitymys thomasi*, Barrett-Hamilton, the only other known Balkan form, and about as in *P. duodecimcostatus*. Differs from the latter in less projecting upper incisors, less obliquely truncate occiput, shorter, broader, and deeper rostrum, relatively wider interorbital region, and flatter, less inflated audital bullæ.

Measurements.—Type. Head and body 95 mm.; tail 25; hind foot (dry) 16; ear 8·2; zygomatic breadth of skull 14·6; mandible 16·2; maxillary tooth-row (alveoli) 6·0; mandibular tooth-row 6·2.

Specimen examined.—The type.

Apodemus sylvaticus creticus, subsp. n.

Type.—Adult female (skin and skull). B.M. no. 5.12.2.27. Collected at Katharo, Crete, by Miss D. M. A. Bate. Original number 27.

Characters.—Size smaller than in the other Mediterranean forms, essentially as in true *sylvaticus*; colour pale and yellowish (ground-colour above a clear, light, yellowish cream-buff, without greyish tinge except occasionally on crown and neck, scarcely different on sides away from line of demarcation, where it becomes slightly more yellowish; back heavily "lined" with black; underparts and feet white, the region from interramia to base of tail dulled by the blackish-slate under-colour).

Measurements.—Type. Head and body 88 mm.; tail 88; hind foot 21; ear 17; condylo-basal length of skull 22·8; zygomatic breadth 12·4; mandible 13·8; maxillary tooth-row 3·8; mandibular tooth-row 3·6. Teeth well worn.

Specimens examined.—Six, all from the island of Crete (two from Kanea, the others from Katharo).

Capreolus capreolus canus, subsp. n.

Type.—Old male (skin and skull). B.M. no. 8.7.7.28. Collected at Quintanar de la Sierra, Burgos, Spain, during the winter of 1907, by the Rev. Saturio Gonzalez. Original number 2.

Characters.—Colour of winter pelage greyish, as in *C. capreolus transsylvanicus*, Matschie, but dark area more coarsely grizzled, and light patches on neck and throat absent or faintly indicated, the whitish area on chin sharply contrasted with region immediately behind it. Summer pelage not known.

Measurements.—Type. Head and body 1220 mm.; hind foot 305; hind foot including hoof 355; ear 120; upper length of skull 161; condylo-basal length 189±; zygomatic breadth 92; mandible 164; maxillary tooth-row 55·8; mandibular tooth-row 66.

Specimens examined.—Eight (three in U.S. National Museum), all from the Province of Burgos, Spain.

LI.—*On Two new Carnivora from North-east Africa.*

By A. Cabrera, C.M.Z.S.

Until so recently as 1909, *Otocyon megălotis*, described by Desmarest in 1822 from specimens obtained by Delalande in the Cape Colony, was the only form of its genus known to naturalists. All subsequent names (*lalandii*, *cafer*, *auritus*), as based also on the South-African animal, are mere synonyms. Now, last year, my friend Mr. G. S. Miller described as *Otocyon virgatus* the long-eared fox from British East Africa (type locality, Naivasha), distinguishing it by the peculiar colour of the tail and the ventral surface of the body, and by the skull "differing from that of *O. megalotis* in the flatter, less inflated audital bullæ, and absence of notch between angular and subangular processes of mandible"[*]. The last detail is not correct, Mr. Miller having been misled by Huxley's bad figure in 'Proceedings of the Zoological Society,' 1880, p. 258, in which the lower jaw presents above the subangular process a deep notch, a purely imaginary characteristic that is never normally present in skulls of *Otocyon*. This may be seen in the woodcut published by Mivart in his 'Monograph of the Canidæ,' p. 205, that figure being the most correct and most trustworthy I have seen.

Otocyon virgatus is, notwithstanding, readily distinguishable from *megalotis* not only by its colour but also by the less inflated bullæ and the smaller teeth, the width of m^1 hardly representing a fifth of the total width of the palate at the level of the same tooth, whereas in *megalotis* the width of this molar is about a quarter of that of the palate.

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[*] Smithsonian Misc. Coll. vol. lii. part 4, no. 1883.

Examining, at the suggestion of Mr. Oldfield Thomas and Mr. G. S. Miller, the Somaliland specimens of *Otocyon* in the British Museum, I find them to represent a third form that may be distinguished by its very pale fur, almost white on the forehead, and its skull with little-developed bullæ and small teeth, like those of *virgatus*, but comparatively shorter and broader, especially on the rostrum. The following is a description of this new species:—

Otocyon canescens, sp. n.

Diagnosis.—Allied to *O. virgatus*, but paler in colour, with more white forehead and a shorter and broader skull.

Colour.—Dorsal surface of body grizzled black and white, the white predominating on the sides, and with a slight buffy tinge over all, due to the underfur, which is pale buff with hair-brown base. The long hairs are black with a broad white band, broader and almost reaching the extreme point on the flanks. Ventral surface ochraceous buff, as in *virgatus*, but a little paler, especially on the throat, where the colour becomes cream-buff. Muzzle and face across the eyes and almost to the ears very dark sepia; the forehead and the cheeks dirty white, in marked contrast with the dark face. The long hair inside the ears and the rim of the same, excepting the point, cream-buff; the outside of the ears brownish black, as usual, and clay-colour about the base. The hind part of the fore legs and the inner part of the hind legs ochraceous buff. Feet black, with some ochraceous hairs on the under side. Tail quite as in *virgatus*, pale ochraceous buff with the point and a broad stripe along the upper side black.

Skull.—Very similar to that of *virgatus*, but easily distinguishable by its broader and shorter rostrum and by the more convex form of the alveolar border of the palate. In *megalotis* and *virgatus* the relation between the greatest width of the palate and the upper dental series (from canine) is about 65 : 100, in *canescens* it is 70 : 100.

Teeth small; pm_2 without the small cusp on the fore part of the base which exists in *megalotis*, and m_4 with the same elements as in m_3, like *virgatus*.

Measurements (type, in the flesh):—

Head and body 437 mm.; tail 285; ear 120.

Skull-measurements of the type and of another specimen of the same species are compared with those of *virgatus* and *megalotis* in the following table:—

	O. canescens.		*O. virgatus.*		*O. megalotis.*	
	Type.	B.M. 6.3.4.4. (Upper Sheik.)	B.M. 8.3.14.1. (Leikipia.)	B.M. 92.10.18.11. (Kilimanjaro.)	B.M. 42.12.6.3. (Cape Col.)	B.M. 46.6.2.20. (S. Africa.)
	mm.	mm.	mm.	mm.	mm.	mm.
Condylobasal length.	110·8	108	104	111·5	(Hinder part of skull broken.)	115
Basilar length......	104	101·2	99	105		106·5
Zygomatic breadth .	64·5	61·5	60	62	55	64
Greatest breadth of brain-case	41	41	42	41·6	43	43
Interorbital breadth.	23·6	24·5	20·4	21	19·5	21
Postorbital constriction	26	30·5	28	28	26·5	27
Breadth on canines .	18·5	20	17·6	18·6	18	17
Width of palate between m^1 and m^2 .	30	29	27	28	28	30
Mandible, from the condyle	81	82	80	86·5	82	86
Upper dental series, from canine......	40·5	41	42·4	43	44	46
Lower dental series, from canine......	48	49	48	50	47	52
Width of m^1	6	(Lost)	5·5	5	6·2	7
Length of the same tooth	4·6		4·8	4·5	4·5	5·5

Hab. "All the internal plateau of Somaliland" (Drake Brockman, 'The Mammals of Somaliland,' p. 49).

Type. Adult, but not old, male. B.M. no. 6. 3. 4. 5. Collected by Mr. Drake Brockman in Somaliland, 10 miles south of Burao, on December 31, 1905. Collector's no. 52.

I have seen, besides the type and the Upper Sheik specimen, procured by Mr. Drake Brockman and mentioned in the above table, another without exact locality, collected by Lord Delamere, and two skulls without skins, one from Lahello, collected by Mr. Peel, and the other presented by Mr. Rowland Ward, without exact locality.

Examining some other African Carnivora in the British Museum, I find that the Nubian *Proteles*, represented in the collection by several specimens obtained in and near Suakim by the late Dr. Anderson and Major Penton, appears to be a new form, so different from the South-African *P. cristatus* that I almost incline to regard it as a distinct species. But other forms of the genus having been previously described as mere subspecies by the Hon. W. Rothschild *, I think it wiser to place the Nubian animal, at least provisionally, in the same category.

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* Nov. Zool. ix. p. 443.

Proteles cristatus pallidior, subsp. n.

Diagnosis.—A very pale form, allied to *P. c. septentrionalis*, but with less black on the mane and tail and brownish, not black, feet.

Colour.—Pale yellowish cream, almost white on the ventral surface and on the forehead, the latter lacking the blackish mixture so conspicuous in *P. cristatus cristatus*. The hairs of the body are quite unicoloured, without the dark brown base always present in the typical race, and there are none of the long black hairs that the South-African animal has among the pale fur. Cheeks and sides of the neck like the body, not rufous as in true *cristatus*. Muzzle black. Ears pale greyish brown. Mane with very little black. All the black bands on the flanks comparatively narrow. Feet dirty cream, coarsely banded with brownish black, and brown about the toes. Tail with two or three inconspicuous indications of blackish bands, and black only at its extreme point.

Skull.—I cannot find any important difference between the skull of this race and that of true *cristatus*, excepting that *pallidior* has a considerably broader interorbital region.

Measurements (type, in the flesh):—

Hind foot 135 mm.; ear 106. Other measurements not available.

As regards the skull, I think it convenient to compare its dimensions with those of another specimen of the same form and also with *septentrionalis* and *cristatus*:—

	P. c. pallidior.		*P. c. septentrionalis.*	*P. c. cristatus.*	
	Type.	B.M. 5.12.2.2. (Suakim.)	B.M. 95.5.2.2. (Near Berbera.)	B.M. 4 3.1.58. (Orange R. C.)	B.M. 2.9.1.28. (Deelfontein.)
	mm.	mm.	mm.	mm.	mm.
Condylobasal length.	130	134	144	134	141
Basilar length	121·5	125·8	134·8	125	132
Zygomatic breadth.	80	82	85	79	81
Greatest breadth of brain-case	45·8	45	47	40	44
Interorbital breadth.	36	31	33·5	25	29
Postorbital constriction	37	36	37	30·8	34
Breadth on canines .	38	38	41	36·4	37
Upper dental series, from canine......	41	41	..*	40	40·5
Lower dental series, from canine......	..*	51	53	..*	..*
Mandible, from condyle	98	94	102	93	97

* The last molar wanting.

Hab. Nubia, at least on the Red Sea coast.

Type. Adult male, from Suakim. B.M. no. 4. 8. 2. 25. Presented by Mrs. Anderson.

I have examined besides this specimen two others (skins and skulls) and three skulls, one of them of a very young animal.

Remarks.—There is a very good figure of this race in Anderson's 'Zoology of Egypt,' pl. xxviii., drawn from a live specimen coming from the Suakim plains. Perhaps it has been represented a little darker and redder than it really was, but the scarcity of black on the tail and mane and the feet pale brown, not black, are well shown. Comparing that figure with the one published by Flower in the 'Proceedings of the Zoological Society,' 1869, pl. xxxix., the difference between the northern and the southern races can be seen at a glance. *Proteles cristatus septentrionalis* (of which there is a good specimen in the British Museum, obtained by Mr. Drake Brockman in Somaliland, 50 miles south of Berbera) has the pale colour and the unicoloured hair of *pallidior*, but with the black feet and the more blackened mane and tail of typical *cristatus*.

LII.—*Rhynchotal Notes.*—LII. By W. L. Distant.

Australasian Pentatomidæ (continued from p. 386).

Neomazium, gen. nov.

Body somewhat flat, broadened posteriorly; head about as long as breadth at base between eyes, the lobes subequal in length, apex of the central lobe very slightly prominent, lateral margins in front of eyes strongly and somewhat obliquely sinuate, distinctly reflexed, abruptly and subangularly terminating a little before apex; eyes substylate; antenniferous tubercles distinctly strongly spined outwardly; antennæ five-jointed, first joint reaching apex of head, second shortest, third longest; pronotum about twice as broad at base as long, the lateral margins concavely sinuate, finely crenulate, the anterior angles strongly outwardly straightly spinous, the lateral angles more obscurely, shortly and finely spinous, posterior margin before scutellum straightly truncate; scutellum about as broad at base as long, its apex reaching or very slightly passing the inner apical angle of the corium which is short, its costal margin convexly rounded, its apical margin truncate, inwardly reaching the base of the penultimate abdominal segment; membrane absent; rostrum slightly passing the posterior coxæ, first joint reaching base of head, second passing the anterior coxæ, third not quite reaching the posterior coxæ; sternum centrally sulcate; abdomen not sulcate; femora only moderately thickened.

A genus to be placed near *Hypogomphus*, Spin. = *Mazium*, Dall.

Neomazium typicum, sp. n.

Head, pronotum, scutellum, and corium dark castaneous, thickly coarsely punctate, the anterior angles of the pronotum pale luteous; antennæ dull ochraceous, first joint a little thickened and about reaching the apex of head, second shortest, shorter than first, third longest, fourth and fifth subequal in length; exposed apical area of abdomen ochraceous, thickly darkly punctate, connexivum paler and less punctate; head beneath and sternum ochraceous, very thickly, blackly, coarsely punctate; abdomen beneath ochraceous, very finely darkly punctate, the lateral margins pale and almost impunctate; coxæ and legs ochraceous, the latter very finely mottled or spotted with castaneous.

Structural characters as in generic diagnosis.

Long. 7½ to 8½ mm.

Hab. Queensland; Peak Downs.

Genus SCIOCORIS.

Sciocoris, Fall. Hem. Suec. p. 20 (1829).

Type, *S. cursitans*, Fabr., = *terreus*, Schrank.

Sciocoris troughtoni, sp. n.

Pale ochraceous, probably uniformly of that colour in fresh specimens, but more or less clouded in the two specimens now before me; head about as long as breadth at base between the eyes, somewhat truncately rounded in front, eyes of moderate size, somewhat prominently projecting, but not quite reaching the anterior angles of the pronotum, central lobe prominent, slightly raised; antennæ pale ochraceous, fourth joint, excluding base, and the whole of fifth joint fuscous, first joint not reaching apex of head, second and third joints almost subequal in length, fourth and fifth longest and also subequal; pronotum about twice as broad at base as median length, the lateral marginal areas sublaminate, their outer edges obliquely rounded, anterior and posterior margins truncate, moderately convexly declivous from base to apex, obscurely finely punctate; scutellum about as long as broad at base, which is subequal to breadth of base of head, lateral margins moderately oblique, distinctly foveate at each basal angle, obscurely finely wrinkled and sparsely punctate; corium finely, sparsely punctate; membrane greyish; connexivum mottled with fuscous brown; legs finely spinulose, posterior tarsi with the basal joint slightly shorter than the remaining joints together, the claws black.

Long. 5 to 6 mm.

Hab. Troughton Island, off the N.W. coast of Australia (*Com. Walker*, Brit. Mus.).

The two specimens on which this species is founded were collected during the voyage of H.M.S. 'Penguin.'

Sciocoris hermannsi, sp. n.

Dull greyish, moderately speckled with blackish, basal area of the scutellum testaceous; membrane with the basal area continued hindward in two longitudinal spots, black; head about as long as breadth between eyes, laterally very slightly sinuate in front of eyes and apically truncately rounded, central lobe prominent and slightly raised, the surface sparsely, somewhat coarsely darkly punctate, eyes of moderate size, prominent, not quite reaching the anterior pronotal angles; antennæ greyish ochraceous, more or less suffused with testaceous, basal joint not reaching apex of head, second and third subequal in length, each shorter than fourth or fifth, which are also subequal; pronotum about twice as broad at base as median length, sparsely irregularly darkly punctate, the anterior marginal area behind head suffused with piceous, the lateral areas sublaminate, their margins moderately rounded; scutellum about as long as broad at base, the basal angles foveate, the basal area testaceous with a few small black macular markings, behind this are two longitudinal fasciate piceous spots and a piceous spot at apex; corium obscurely finely punctate, the costal area a little paler, the costal margin speckled with black; body beneath and legs ochraceous, posterior tarsi with the basal joint almost as long as the two remaining joints together.

Long. 6 mm.

Hab. Central Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

Sciocoris rubens, sp. n.

Testaceous with piceous mottlings; head about as long as breadth between eyes, the central lobe distinctly prominent, thickly punctate, the lateral margins paler and spotted with piceous, eyes prominent, not quite reaching anterior pronotal angles; antennæ ochraceous, basal joint not reaching apex of head, second joint slightly shorter or subequal in length to third, fourth and fifth longest and subequal; pronotum about twice as broad at base as median length, thickly punctate, the lateral margins sublaminately reflexed, paler in hue and finely spotted with piceous, basal margin narrowly black; scutellum about as long as broad at base, the basal angles foveate, a longitudinal fasciate spot formed by blackish punctures on each lateral area, not reaching apex, a small but distinct black marginal spot on each side before apex; corium thickly finely punctate, base of lateral margins slightly laminate, paler and finely spotted with brownish; membrane piceous, not reaching the abdominal apex; connexivum ochraceous with brownish spots; body beneath and legs ochraceous; posterior tarsi with the basal joint shorter than the two remaining joints together.

Long. 6 mm.

Hab. Central Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

ADELAIDENA, gen. nov.

Head about as long as broad at base, only slightly narrowed towards apex which is broadly subtruncate, the margins slightly reflexed, distinctly declivous in front of eyes, which are prominent but not reaching anterior pronotal angles; antennæ five-jointed, basal joint not reaching apex of head; pronotum about twice as broad at base as medially long, the lateral margins laminate, reflexed and roundly oblique, anterior margin concave between the eyes, posterior margin truncate, posterior lateral angles subprominent; scutellum longer than broad, narrowing to apex, lateral margins to near apex oblique, slightly sinuate, about as long as pronotum and head together; corium longer than scutellum, its apical angle extending to near the apical margin of the abdomen; connexivum exposed; membrane small but slightly passing the abdominal apex, the veins mostly longitudinal; rostrum reaching the posterior coxæ, first joint reaching base of head, second reaching anterior coxæ, third longest; femora moderately thickened; posterior tarsi with the basal joint much shorter than the remaining joints together.

Allied to *Sciocoris* and principally differing by the length and shape of the scutellum.

Adelaidena regina, sp. n.

Above greyish ochraceous, mottled with bl sparingly coarsely brownly punctate, a distinct imp spot a little before each eye, a few black punctures at middle of apical margin; antennæ with the first, second, and third joints ochraceous with a few brown punctures, fourth and fifth black with their bases ochraceous, second and third almost subequal in length, fourth and fifth distinctly incrassated excluding base and subequal in length; pronotum sparingly rather coarsely brownly punctate, the cicatrices bordered with black, and a transverse series of black punctures about one-third from base continued in six longitudinal series to base, in the basal area there are also six levigate ochraceous lines; scutellum sparingly coarsely punctate, some of the punctures being black, a black spot at each basal angle and a small black spot on each side a little before apex; corium and connexivum sparingly coarsely brownly punctate, the latter with the incisures margined on each side with black, membrane greyish with the veins brownish; body beneath and legs very pale ochraceous, abdomen castaneously punctate on each lateral area; femora blackly punctate near apices, tibiæ blackly punctate on central area, posterior legs mutilated in type; structural characters as in generic diagnosis.

Long. 6 mm.; exp. pronot. angl. 4 mm.

Hab. N.W. Australia; Adelaide River (*Com. Walker*, Brit. Mus.).

Collected during the voyage of H.M.S. 'Penguin.'

Genus MENESTHEUS.

Menestheus, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 504.

Type, *M. nercivus*, Dall.

In Stål's description of the genus he gives the head as much longer than the pronotum; this is quite correct as in *M. cuneatus*, Dist., but not so with regard to the type *M. nercivus*, Dall., in which the head and pronotum are equal or subequal in length, as they are also in the species now described.

Menestheus doddi, sp. n.

Dull ochraceous, punctured with brownish; head about as long as pronotum, narrowing to apex, the lateral lobes considerably longer than the central, meeting beyond it with their apices distinctly separated, the central lobe is blackly

side and the lateral lobes outwardly mar-
unctate (excluding bases and apices), an
before each eye; antennæ ochraceous,
joints fuscous, basal joint short, stout, about
of lateral margins, first, second, and third
joints subequal in length, fourth and fifth much the longest, subequal in length and distinctly pilose; pronotum thickly brownly punctate, the lateral margins pale, an obscure transverse impression a little before middle, and a central longitudinal brownish line, the anterior angles somewhat acutely prominent outside the eyes; scutellum thickly brownly coarsely punctate, a black foveate spot near each basal angle, from the neighbourhood of which are two pale levigate lines converging near middle and then contiguously longitudinally continued to apex; corium thickly finely brownly punctate, base of lateral margin narrowly ochraceous; membrane greyish, the veins much darker; connexivum dull ochraceous, spotted with piceous; body beneath and legs (imperfectly seen in carded specimen) dull ochraceous, a sublateral pale fascia on each side of sternum, the lateral areas darker, a small black spot on each side of pro-, meso-, and metasterna.

Long. 5½ mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

A very small but distinct species of the genus.

Genus Eribotes.

Eribotes, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 504.

Type, *E. australis,* Dall.

Eribotes leana, sp. n.

Ochraceous, fasciately marked with blackish; head about as long as pronotum, central lobe subequal in length to the lateral lobes, but a little prominent at apex, coarsely punctate, margins of central lobe and outer margins of lateral lobes (excluding bases and apices) blackly punctate, an impunctate spot before each eye; antennæ with the first, second, and third joints ochraceous, fourth black, first short and stout, second and third subequal, each much shorter than fourth, fifth mutilated in the two specimens examined; pronotum coarsely punctate, with four longitudinal somewhat oblique fasciate series of black punctures, lateral margins moderately ampliately rounded and slightly reflexed; scutellum a little longer than the corium, sparsely coarsely punctate, an oblique black line at each basal angle and a central black spot at apex, three pale raised levigate fasciæ uniting near middle and then continued in a central fascia to near apex; corium darkly punctate, the veins prominent and levigate, membrane short, greyish, the veins fuscous and more or less furcate; connexivum finely spotted with blackish; body beneath and legs ochraceous; sternum coarsely punctate with a sublateral area of black punctures, a small black spot on each side of pro-, meso-, and metasterna; spiracles and small abdominal marginal spots black; apical joint of tarsi black.

Long. 6 to 7 mm.

Hab. N. S. Wales (*A. M. Lea*, Brit. Mus.).

Allied to *E. australis*, Dall., but differing in the longer fourth joint of the antennæ, the larger linear black impression to the basal angles of the scutellum, &c.

Eribotes hobartensis, sp. n.

Somewhat broadly ovate, more or less ochraceous, darkly punctate; head as long as broad between eyes, brownish ochraceous, the central lobe and lateral margins more or less pale ochraceous, some black punctures on each side of the apex and base of the central lobe, lateral lobes distinctly punctate, their apices slightly passing the apex of the central lobe, their lateral margins a little reflexed; antennæ with the first, second, and third joints ochraceous, fourth and fifth black, basal joint stout, not nearly reaching apex of head, second and third almost subequal in length, each shorter than third or fourth, which are also subequal; pronotum about half as long as broad at base, slightly convex, coarsely punctate, brownish ochraceous, the lateral margins rounded towards eyes, reflexed and distinctly paler; scutellum longer than broad at base, ochraceous, more or less darkly punctate, a black foveate line at each basal angle, two oblique pale levigate linear fasciæ, commencing near basal angles, outwardly furcate near base and uniting on disk about one-third before apex, the punctures on the apical area more distinct and darker; corium brownish ochraceous, finely, darkly punctate, membrane short, greyish; body beneath and legs (imperfectly seen in carded typical specimen) pale ochraceous.

Long. 5½ mm.; exp. pronot. angl. 3½ mm.

Hab. Tasmania; Hobart (Brit. Mus.).

Differs from the preceding species, *E. leana*, in the more rounded lateral pronotal margins, &c.

Eribotes challengeri, sp. n.

Ochraceous, coarsely darkly punctate; head about as long as breadth between eyes, the lateral lobes distinctly longer than the central lobe but not converging beyond it, central lobe margined with black punctures on each side and an outer marginal series of black punctures to each lateral lobe, lateral margins moderately reflexed, apices of lateral lobes subangulate ; antennæ piceous, first joint very short, second longer than third, which is slightly thickened apically, fourth and fifth longest and subequal in length ; pronotum about twice as broad at base as medial length, coarsely darkly punctate, a central longitudinal pale levigate line, the lateral margins pale ochraceous, a little laminately reflexed ; scutellum broad, about as long as broad at base, coarsely darkly punctate, a black spot at each basal angle and a small black spot at apex, a central pale longitudinal levigate line with which a similar oblique line from each basal angle is fused near middle ; corium sparingly coarsely punctate ; membrane greyish brown, the veins darker ; head and sternum beneath greyish brown, very coarsely punctate, sternal margin pale ochraceous ; legs and abdomen ochraceous, the latter with a sublateral black fascia on each side, the spiracles and some minute marginal spots black, a triangular black spot on anal segment ; femora speckled with fuscous.

Long. 6 mm.

Hab. N. Queensland (*'Challenger' Exped.*, Brit. Mus.).

Distinguished by the projecting apices of the lateral lobes to the head.

Genus CEPHALOPLATYS.

Cephaloplatus, White, Tr. Ent. Soc. Lond. iii. p. 91 (1842).
Cephaloplatys, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 506 (emend.).

Type, *C. pertyi*, White.

Cephaloplatys pallipes.

Cephaloplatus pallipes, Walk. Cat. Het. iii. p. 541 (1868).

This species, which was described by Walker from an unlocalized specimen, has now been received rather freely by the British Museum from Alexandria in North Australia.

Cephaloplatys reticulatus.

Cephaloplatys reticulatus, Bergr. Proc. Roy. Soc. Victoria, vii. p. 288 (1895).

This species was originally described from Queensland. Specimens now in the British Museum from W. Australia, Violet Range, E. Murchison, also agree perfectly with Bergroth's description.

Cephaloplatys darwini, sp. n.

Dull ochraceous, coarsely punctured and mottled with brownish; head with the lateral lobes distinctly longer than the central, but with their apices divergent and subangulate, apical halves of lateral margins rounded and moderately reflexed, a long robust spine in front of eyes, sparingly coarsely brownly punctate; antennæ with the first, second, and third joints stramineous, fourth and fifth ochraceous, excluding first, the joints are subequal in length, first thickened and not nearly reaching apex of head; pronotum twice as broad as long, the lateral margins sinuate, anteriorly ampliate and strongly dentate, the anterior angles produced to beyond the middle of the eyes, lateral angles shortly angularly produced, somewhat thickly coarsely punctate; scutellum a little more finely punctate, a blackish foveate spot at each basal angle, and three small dark marginal spots at apex; corium sparingly finely punctate; membrane greyish ochraceous, the veins darker and more or less longitudinal; connexivum ochraceous, inwardly punctate, distinctly angulate at the posterior segmental angles; body beneath pale ochraceous, coarsely darkly punctate, at middle of abdomen almost impunctate; a central spot to mesosternum, two basal spots, a submarginal fascia on each side extending to base of penultimate segment, and a central longitudinal spot to apical segment, black; legs ochraceous, spotted with piceous; rostrum reaching posterior coxæ, its apex black.

Long. 10 mm.

Hab. N. Australia; Port Darwin (*Com. Walker*, Brit. Mus.).

Collected during the voyage of H.M.S. 'Penguin.'

Allied to *C. fasciatus*, Dist., but differing in the less produced anterior pronotal angles, which in *C. fasciatus* considerably pass the anterior margins of the eyes, the long distinct spine in front of eyes, &c.

Cephaloplatys clementi, sp. n.

Dull ochraceous, somewhat thickly darkly punctate; head sparingly, coarsely punctate, lateral lobes longer than the central, their apices divergent, the lateral margins ampliately reflexed, rounded anteriorly, sinuate posteriorly, only obtusely angulate in front of eyes; antennæ with the first, second, and third joints pale ochraceous, fourth and fifth more or less infuscate, first not nearly reaching apex of head, second and third subequal in length, each a little shorter than fourth or fifth, which are also subequal; pronotum twice as broad at base as medially long, thickly coarsely punctate, the lateral areas anteriorly ampliate, the anterior angles roundly acutely produced, their apices somewhat longly passing the anterior margins of the eyes, extreme margins not dentate, on anterior disk an obscure transverse pale almost impunctate line containing four small blackish punctate spots, posterior angles subprominent, sinuate and subangulate; scutellum somewhat sparsely darkly punctate, a black foveate spot at each basal angle; corium thickly and rather more finely punctate; membrane greyish; connexivum ochraceous, the posterior segmental angles only obscurely angulate; body beneath ochraceous, more or less thickly darkly punctate; a spot at base of head beneath, a curved submarginal line on each segment of the sternum, a central spot to mesonotum, a sublateral fascia to anterior half and a medial segmental series of spots to abdomen, black; legs ochraceous, spotted with castaneous; rostrum reaching posterior coxæ, its apex black.

Long. 11 mm.

Hab. W. Australia; Nicol Bay Distr. (*Dr. Clement*, Brit. Mus.).

A broad ovate species also allied to *C. fasciatus*, Dist., by the largely produced anterior pronotal angles, but differing by the non-crenulate pronotal margins, the broader and more laterally sinuate head, the less produced segmental angles of the connexivum, &c.

Cephaloplatys minor, sp. n.

Castaneous brown, rugulose and punctate; anterior margin of head, lateral margins and anterior angles of pronotum, and basal areas of lateral margins to corium ochraceous with brown punctures; scutellum with a levigate ochraceous spot in each basal angle; membrane greyish; connexivum ochraceous with black spots; body beneath black, coxæ and legs ochraceous, coxæ punctured with brownish; head thickly punctate, the anterior and lateral marginal areas somewhat broadly ampliately reflexed, lateral lobes moderately but distinctly longer than the central, their apices broad and rounded, lateral margins sinuate, prominent but not spinous before eyes; antennæ with the first and second joints stramineous, third, fourth, and fifth piceous, apex of third, base and apex of fourth, and base of fifth ochraceous, basal joint thickened and not reaching apex of head, first and second shortest and subequal in length, third, fourth, and fifth also subequal; pronotum about twice as broad at base as length, lateral margins concavely sinuate, anterior angles spinous, not quite reaching eyes, but extending outwardly beyond them, posterior angles subprominent and subspinous; scutellum coarsely punctate, a broad obscure central ridge extending from apex to middle and then bifurcating towards each basal angle, corium thickly punctate; rostrum ochraceous and reaching the posterior coxæ.

Long. 7⅓ mm.

Hab. Queensland; Peak Downs.

MYCOOLONA, gen. nov.

Head about as long medially as breadth at base between eyes, moderately flattened, the lateral lobes a little longer than the central lobe, but not converging beyond it, their lateral and apical margins reflexed, the latter sinuate; eyes prominent; ocelli near base of head, scarcely nearer eyes than to each other; antennæ of five joints, first not reaching apex of head, second and third joints almost subequal in length, each slightly shorter than fourth or fifth, which are also subequal in length; pronotum about half as long as breadth between pronotal angles, the lateral margins slightly reflexed, the posterior angles subprominent; scutellum longer than broad, a distinct black impression, longer than broad, in each basal angle; corium a little shorter than pronotum and scutellum together; membrane not passing abdominal apex; rostrum with the first joint not extending behind the bucculæ, its apex about reaching the posterior coxæ; odoriferous aperture continued in a long slender groove.

Type, *M. atricornis*, Westw.

The position of this genus is apparently near that of *Anaxarchus*, Stål.

Mycoolona atricornis.

Ælia atricornis, Westw. in Hope Cat. i. p. 32 (1837).

——? *atricornis*, Dist. Proc. Zool. Soc. Lond. 1900, p. 818, pl. liii. f. 8.

Hab. Tasmania (Brit. Mus.). "Nova Hollandia" (*fide Westwood*).

Two specimens of this species received from Tasmania now afford an opportunity for generic location, the type not being in a sufficiently perfect condition for that purpose when I examined and figured it in 1900.

THOLOSANUS.

Tholosanus, Dist. Ann. & Mag. Nat. Hist. (7) iv. p. 432 (1899).

Type, *T. proximus*, Dall.

Tholosanus piceatus, sp. n.

Above pitchy black; anterior lateral margins of the pronotum, base of lateral margins to corium, and lateral margins to connexivum ochraceous; body beneath and legs ochraceous, a small black spot on the lateral areas of each sternal segment, abdominal spiracles black; head broad, about as long as breadth at base, the margins somewhat strongly reflexed, wrinkled and punctate; antennæ black, first joint more or less castaneous, not reaching apex of head, second joint distinctly longer than the third, second, fourth, and fifth subequal in length; pronotum thickly finely punctate, distinctly and somewhat more palely wrinkled on basal half, the lateral margins narrowly reflexed, the anterior angles slightly but distinctly angularly prominent, posterior angles rounded; scutellum a little longer than broad at base, thickly, finely punctate and more or less transversely wrinkled; corium thickly finely punctate; membrane reaching or very slightly passing abdominal apex; rostrum reaching the posterior coxæ, first joint not quite reaching base of head, second extending to anterior coxæ, third about reaching intermediate coxæ.

Long. 10½ mm.

Hab. Tasmania; Hobart (*A. M. Lea*, Brit. Mus.).

Allied to *T. proximus*, Dall., but with the scutellum distinctly more attenuate posteriorly, different colour, &c. *T. proximus* has also been received from Tasmania.

KALKADOONA, gen. nov.

Head about as long as breadth between eyes, moderately deflected, distinctly broadest at base, lateral margins strongly sinuate, the lateral lobes distinctly longer than the central but not meeting beyond it, apically widened, anteriorly somewhat obliquely truncate and marginally reflexed; ocelli near base and much nearer eyes than to each other; antennæ with the first joint almost reaching apex of head, second longest, third a little shorter than either fourth or fifth; pronotum deflected towards head, twice as broad between the humeral angles as median length, the posterior angles prominent and broadly subacute, lateral margins concavely sinuate, anterior and posterior margins truncate, anterior angles roundly subprominent; scutellum about as long as broad at base, somewhat gibbous on basal area, posteriorly attenuated, the apex rounded and slightly passing the interior angles of the corium; membrane slightly passing the abdominal apex; rostrum moderately passing the posterior coxæ, first joint reaching base of head, second almost reaching the intermediate coxæ, third extending to the posterior coxæ; abdomen convex beneath.

I place this genus near *Arniscus*, Dist.

Kalkadoona centromaculata, sp. n.

Ochraceous; head with the basal area punctate, the lateral lobes finely wrinkled; antennæ with the first, second, and third joints pale ochraceous, apex of third and the whole of the fourth and fifth joints testaceous; pronotum distinctly punctate and more or less rugulose, between the humeral angles a transverse series of four, sometimes indistinct, fuscous spots; scutellum finely wrinkled and distinctly punctate, its apical margin narrowly testaceous; corium thickly finely punctate; membrane greyish; connexivum with the posterior angles of the segments moderately prominent; sternum coarsely punctate; abdomen beneath finely, indistinctly punctate; legs more or less finely spotted with fuscous; abdomen above black, thickly finely punctate, the last two segments and the connexivum pale ochraceous, more or less blackly punctate; structural characters as in generic diagnosis.

Long. 7½ mm.; exp. pronot. angl. 5 mm.

Hab. Centr. Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

HILLIERIA, gen. nov.

Body elongate; head longer than pronotum, about as long as scutellum, longly acuminate, the lateral lobes about twice as long as the central and meeting beyond it; ocelli at base, nearer eyes than to each other; antennæ five-jointed, inserted beneath and a little before eyes, first joint stout, short, equal in length to third, each a little shorter than second, third and fourth longest, subequal in length, third not reaching apex of head; pronotum about twice as broad at base as medial length, moderately depressed on its anterior half, lateral margins concavely sinuate, the anterior angles somewhat longly anteriorly spinous; anterior margin strongly concave for the reception of the head, posterior margin truncate before scutellum, the posterior angles broad, subtruncate; scutellum a little longer than broad at base, attenuated and somewhat depressed posteriorly, extending for about one-fourth beyond the inner angle of the corium; corium somewhat narrow, connexivum exposed for half its length; membrane with longitudinal veins, some furcate; bucculæ suddenly narrowing at the base of rostrum, apex of rostrum just passing the intermediate coxæ, first joint not quite reaching base of head, second joint reaching anterior coxæ, third terminating between the anterior and intermediate coxæ; sternum centrally longitudinally sulcate.

A genus to be placed near the Ethiopian *Acoloba*, Spin.

Hillieria acuminata, sp. n.

Greyish brown; head finely punctate, lateral margins narrowly piceous, eyes black; antennæ with the first, second, and third joints ochraceous, fourth and fifth testaceous red; pronotum with a central longitudinal impression, the basal half thickly punctate and somewhat rugulose, the anterior apical spines paler in hue and straightly extended to the anterior margins of the eyes; scutellum obscurely longitudinally ridged and transversely wrinkled, the lateral margins distinctly punctate; corium thickly and more finely punctate; membrane greyish white; body beneath and legs ochraceous; apex of rostrum black; structural characters as in generic diagnosis.

Long. 9½ to 12 mm.

Hab. Central Australia; Hermannsburg (*H. J. Hillier*, Brit. Mus.).

PSEUDÆLIA, gen. nov.

Body subelongate; head about as long as broad at base, central and lateral lobes subequal in length, the latter with their apices subacute, ocelli at base, nearer eyes than to each other, moderately attenuated anteriorly, lateral margins slightly sinuate in front of eyes, a little raised on basal area, thence deflected to apex; antenniferous tubercles outwardly shortly spined; antennæ five-jointed, basal joint short, second longer and about reaching apex of head, third slightly shorter than second, fourth and fifth longest; pronotum half as long as breadth at base, lateral margins moderately obliquely sinuate, posterior angles roundly subprominent, anterior margin concavely sinuate, posterior margin truncate; scutellum distinctly longer than broad at base, its apical third attenuated; corium about as long as head and pronotum together, its apical margin truncately oblique; connexivum exposed from about half the length of corium; membrane almost reaching abdominal apex, the veins longitudinal; bucculæ strongly roundly elevated for about their apical halves; rostrum reaching the posterior coxæ, first joint reaching base of head, second nearly twice as long as third and fourth together; sternum centrally sulcate; legs of moderate length, anterior tarsi with the second joint shortest, posterior tarsi mutilated in type; abdomen beneath moderately convex.

In general appearance allied to *Ælia*, from which it is altogether distinct by the subequal length of the lateral and central lobes of the head; allied to *Lubentius* by the elevated bucculæ and sulcated sternum, but differing among other characters by the non-sulcated abdomen beneath.

Pseudælia clementi, sp. n.

Bright ochraceous with prominent longitudinal black fasciæ; two central black fasciæ commencing at apex of head, where they are fused and continued through head, pronotum, and scutellum, on the apical area of the latter they are attenuated and terminate a little before apex, lateral margins of head black; pronotum with a sublateral fascia and a short basal one between it and the two central fasciæ; extreme lateral margins of scutellum black; corium with two broad black fasciæ united at base, but not on apical margin; membrane greyish, with longitudinal black fasciæ broadly covering the veins; connexivum ochraceous; body beneath ochraceous, with two longitudinal black fasciæ on each side and a central fascia on abdomen, these fasciæ are a little narrower than those above and on the head are somewhat broken; legs ochraceous, subapical annulations to femora, apices of tibiæ, and the tarsi black; above strongly coarsely punctate, especially in the black fasciæ, some of the intervening pale spaces being levigate and impunctate; antennæ ochraceous, fourth and fifth joints more or less infuscate; sides of the bucculæ, apical area of head beneath, acetabula, and the anterior and posterior margins of the sternal segments more or less strongly punctate; other structural characters as in generic diagnosis.

Long. 12 mm.

Hab. W. Australia; Nicol Bay Distr. (*Dr. Clement*, Brit. Mus.).

Genus Sepontia.

Sepontia, Stål, Hem. Afr. i. p. 183 (1865).

Type, *S. misella*, Stål.

Sepontia parva, sp. n.

Head black with an ochraceous levigate spot near anterior margin of each eye; antennæ stramineous, with the apical joint moderately infuscate; pronotum ochraceous, thickly darkly punctate, the anterior area black with two small central levigate ochraceous spots, and posteriorly containing two transverse pale punctate spots, the anterior and lateral margins narrowly ochraceous, the latter with a small submarginal spot near their middle; scutellum ochraceous, darkly punctate and with irregular dark mottlings; body beneath black; lateral margins of prosternum and small marginal spots stramineous; legs testaceous; sternum coarsely punctate, abdomen finely, very thickly punctate.

Long. 3 mm.

Hab. Queensland; Mackay (*R. E. Turner*, Brit. Mus.).

Allied to the Oriental and Malayan *S. variolosa*, Walk., from which it differs by its narrower pronotum. In *S. variolosa* the breadth of the pronotum at base between the humeral angles is equal to the whole length of the body; in *S. parva* it is distinctly shorter.

NEOSTOLLIA, gen. nov.

Stollia, sect. a, Stål, En. Hem. v. p. 81 (1876).

Intermediate between *Sepontia* and *Eusarcocoris*. It agrees with *Sepontia* in the large scutellum extending to the apex of the abdomen, and the deflected head, but differs by the character given by Stål, "frenis vix plus quam quintam partem laterum scutelli occupantibus," a character which also separates it from *Eusarcocoris*, as also does the larger scutellum.

Type, *N. fasciolata*, Stål.

Stål enumerated his *fasciolata* as forming a section of *Eusarcocoris*=*Stollia*; it, however, seems to have stronger affinities with *Sepontia* and a generic division becomes almost a necessity.

Neostollia fasciolata.

Stollia fasciolata, Stål, En. Hem. v. p. 81 (1876).

Hab. Australia.

Neostollia bellula, sp. n.

Head longer than broad at base, strongly declivous, black, thickly coarsely punctate, lateral margins distinctly sinuate; antennæ ochraceous, the apical joint infuscate, first joint not reaching apex of head, second and third subequal in length, each a little shorter than fourth or fifth; pronotum nearly twice as broad between humeral angles as median length, posterior half black, thickly punctate, anterior half testaceous, less thickly punctate, with two large black spots near each anterior angle, behind these are two central levigate pale ochraceous spots only separated by a series of dark punctures, the anterior lateral margins also pale ochraceous, posterior angles obtusely prominent; scutellum black or dark castaneous, thickly coarsely punctate, with a large oblique levigate pale ochraceous spot near each basal angle; corium coarsely punctate, the basal area dull ochraceous, darkly punctate, the apical area blackish; head beneath black, its basal margin ochraceous; sternum dull ochraceous, thickly darkly punctate, its lateral margins paler and impunctate, posterior angles of prosternum and sublateral margins of meso- and metasterna black or blackish; abdomen beneath shining black, the lateral margins ochraceous, somewhat thickly punctate, extreme lateral margin with small black spot at the segmental incisures; leg ochraceous spotted with black.

Long 5 to 5½ mm.

Hab. Queensland; Mackay (*R. E. Turner*, Brit. Mus.).

Allied to *N. formosa*, Dist., but with the basal angular levigate spots to scutellum much smaller and much wider apart, the levigate discal space on pronotum divided by punctures, &c., this last character also separating it from *N. fasciolata*, Stål, which is thus described: "marginibus lateralibus anticis, fasciolaque discoidali lævigatus thoracis."

Neostollia formosa.

Sepontia formosa, Dist. Ann. & Mag. Nat. Hist. (7) xii. p. 474 (1903).

Malayan Archipelago; Tomia.

[To be continued.]

LIII.—*The Anatomy and Classification of the Teleostean Fishes of the Order Zeomorphi.* By C. Tate Regan, M.A.

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The fishes of the order Zeomorphi are acanthopterous physoclists with thoracic pelvic fins and the pelvic bones directly attached to the cleithra. They are peculiar in that the spines which precede the anal form a separate fin, this spinous anal, however, being much shorter than the spinous dorsal and formed of only one to four spines; the caudal has 12 or 13 principal rays, of which 10 to 12 are branched; in addition there are 1 to 3 small simple rays above and below. Each pelvic fin is formed of a spine and of from 5 to 9 branched rays; this suggests relationship to the Berycoids, and indeed the Zeomorphi appear to differ from the Berycomorphi only in certain features of specialization, such as the reduction in number of the caudal rays and the absence of an orbitosphenoid. The simple post-temporal, which bridges the posterior temporal fossa and is rigidly united to the epiotic or parietal above and to the opisthotic or pterotic below, has a 'temporal' plate firmly attached along its anterior edge; the cleithrum runs upwards internal to the supracleithrum and ends in a pointed projection just behind the post-temporal, and there is a single post-cleithrum on each side. The first vertebra is very firmly attached to the cranium, the centrum to the basioccipital, and the neural arch, which is open above, to the exoccipitals; in the præcaudal region the anterior neural spines are directed backwards, but the posterior ones are erect or even point forwards; the anterior præcaudal vertebræ have no parapophyses and the ribs are sessile, but the posterior ones are furnished with downwardly directed parapophyses to which the ribs are attached.

The fishes which have the above features in common may be thus arranged:—

Family 1. **Zeidæ.**

Mouth very protractile; no supramaxillary; no subocular shelf. Anterior trunk-muscles not or only just reaching the posterior ends of the frontals, which are formed of ridged, tuberculated, or pitted lateral portions bordering a median depression for the reception of the long posterior processes of the præmaxillaries; occipital crest thin; suspensorium inclined obliquely forwards and metapterygoid reduced; 7 or 8 branchiostegals; 3½ gills, no slit behind the last; pseudobranchiæ present. 31 to 46 vertebræ. Caudal with 13 principal rays, of which 11 are branched; 1 to 4 anal spines; each pelvic fin of a spine and 5 to 9 branched rays.

Recent genera are *Zeus*, Linn., *Zenopsis*, Gill, *Cyttus*, Günth., *Cyttopsis*, Gill, *Cyttosoma*, Gilchr., *Neocyttus*, Gilchr., *Pseudocyttus*, Gilchr., *Oreosoma*, Cuv. & Val., *Zenion*, Jord. & Everm., *Capromimus*, Gill, and *Grammicolepis*, Poey.

Zeus appears to date from the Oligocene, and the name *Cyttoides* has been given to an Oligocene fish of this family.

Starks has given a good account of the osteology of *Zeus* (Proc. U.S. Nat. Mus. xxi. 1898) and Shufeldt has described the skeleton of the unique specimen of *Grammicolepis* (Journ. Morph. ii. 1889). I have examined skeletons of *Zeus*, *Cyttus*, and *Neocyttus*; the last two differ from *Zeus* and resemble *Grammicolepis* in the presence of a basisphenoid, and in the greater prominence of the supraoccipital, which separates the parietals. In *Zeus* and *Cyttus* there are 31 or 32 vertebræ and the downwardly directed parapophyses of the posterior præcaudals unite to form closed hæmal arches; in *Neocyttus*, which has 40 vertebræ, the parapophyses are somewhat divergent and only the last three pairs are bridged across, whilst *Grammicolepis*, with 46 vertebræ, seems to have a like structure.

Neocyttus is very similar to *Grammicolepis* in cranial osteology, and comparison of the skeleton of the former with Shufeldt's figures of the latter shows that the main difference is that in *Neocyttus* the supraoccipital and parietals are smaller and the frontals larger, with their rugose portions expanded behind and nearly meeting in front of the supraoccipital. Rather large rugose nasal bones are firmly attached on each side to the anterior ends of the frontals and project inwards above the præmaxillary processes; it is evident that Shufeldt has mistaken these for part of the frontals.

Family 2. **Caproidæ.**

Anterior trunk-muscles not reaching the frontals, which are rugose; occipital crest with the upper edge thickened and rugose. 6 branchiostegals; 4 gills, a slit behind the fourth; pseudobranchiæ present. 22 vertebræ. Caudal fin with 12 principal rays, all or 10 of which are branched; 3 anal spines; each pelvic fin of a spine and 5 branched rays.

Subfamily 1. *Antigoniinæ.*

Mouth moderately protractile; præmaxillary processes only just reaching the frontals; maxillary broad, bearing a large supramaxillary; no subocular shelf. Spinous dorsal shorter than the soft-rayed fin.

The skeleton of the single genus *Antigonia*, Lowe, has been well described by Starks (Proc. U.S. Nat. Mus. xxv. 1902), who has, however, overlooked one feature of importance, viz., the firm attachment of the first vertebra to the skull. As he gives the number of vertebræ as 21 it seems probable that in the preparation of the skeleton the first vertebra adhered to the cranium, and was then removed separately and perhaps lost.

Subfamily 2. *Caproinæ.*

Mouth extremely protractile; præmaxillary processes very long, separating the frontals and extending back beneath the supraoccipital; maxillary narrow, without supramaxillary; a broad subocular shelf. Spinous dorsal not shorter than the soft-rayed fin.

The Miocene *Proantigonia*, Kramberger, is closely allied to the recent *Capros*, Lacep.

LIV.—*The Origin and Evolution of the Teleostean Fishes of the Order Heterosomata.* By C. Tate Regan, M.A.

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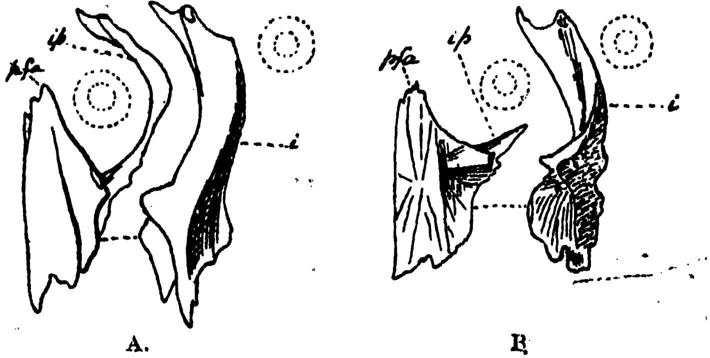
The Heterosomata, or Flat-fishes, differ from all other fishes in their asymmetry; both eyes are on one side, which is coloured, whilst the eyeless side is usually white.

Fig. 1.



Disarticulated frontal bones of (A) Halibut (*Hippoglossus hippoglossus*) and (B) Plaice (*Pleuronectes platessa*). (After Traquair.)

pfa, præfrontal articulation; *ip*, interorbital process; *i*, interorbital bar.

In the skull of all flat-fishes there is a bony interorbital bar mainly formed by the interorbital portion of the frontal bone of the eyed side, displaced outwards and downwards; the frontal of the blind side is broad and may send forward a process to share in the formation of the interorbital bar, but the main part of this bone in the orbital region is on the wrong side of its eye, although its relations are normal in other respects. The last-named fact leads one to suspect the correctness of Traquair's interpretation of this part of the frontal of the blind side, which he regards as a new process sent forwards to join the præfrontal in order to form a bar or bridge supposed to be requisite for the stability of the cranium.

Traquair's * elaborate descriptions and figures of the crania of several flat-fishes are most valuable, and his interpretation is in harmony with the often repeated statement that the migration of the eye causes or is caused by a twisting of the whole orbital region of the skull, and has been generally accepted; but recent embryological work does not, in my opinion, bear out this view. As is well known, flat-fish larvæ have the eyes on opposite sides and swim vertically, and at an early age one eye migrates round the top of the head to the other side, which is thenceforth uppermost.

Williams † has studied the migration of the eye in *Pleuronectes americanus*; in the cartilaginous cranium there are two supraorbital bars, precursors of the frontal bones, connecting the lateral ethmoids with the otic capsules; preparatory to the metamorphosis there is a rapid resorption of the part of the supraorbital bar which lies in the path of the migrating eye, so that this bar becomes reduced to a forwardly directed process of the otic capsule and a backwardly directed one of the lateral ethmoid. The eye migrates between these two projections, and so approaches the supraorbital bar of the future eyed side; the eyes then move to their final position, causing a torsion of this supra-orbital bar, which also affects the ethmoid region; after the shifting is complete, ossification takes place.

From this account it seems that it is wrong to say that the two eyes are on one side as the result of the twisting of the orbital region of the skull, for the first step is a migration of one eye into the territory of its frontal bone, [illegible]ing resorption of cartilage in the larva, and in the adult ge[illegible]ing the effect that the orbital part of its frontal ossifies is [illegible]t or even entirely outside it. The displacement of the ob[illegible] of the lower eye has enlarged the area of that of the upper eye; but it seems wrong to speak of any part of the latter bone as a new formation, least of all that part which has the same position and the same relations (except to the eye) as it would have if the skull were symmetrical.

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* Trans. Linn. Soc. xxv. 1865, pp. 263–296, pls. xxix.–xxxii.

† Bull. Mus. Comp. Zool. xl. pp. 1–57, pls. i.–v. (1902).

For a long time the flat-fishes were regarded as asymmetrical Gadoids, but in the latter the absence of spinous fin-rays, the large number of rays in the pelvic fins, and the indirect attachment of the pelvic bones to the cleithra may be regarded as primitive features, and it is probable that these fishes have evolved from generalized Iniomi, such as the Aulopidæ. In the Heterosomata, on the contrary, spinous fin-rays are present in *Psettodes*, the least specialized member of the order, the pelvic fins are never more than 6-rayed, and the pelvic bones are directly attached to the cleithra. *Psettodes* is simply an asymmetrical Percoid; about the first ten dorsal rays are spinous, the caudal has 17 rays, 15 of which are branched, and each pelvic fin is formed of a spine and 5 soft rays. The mouth, the skull (except for its asymmetry), the pectoral arch, and the vertebral column are all quite Percoid.

In other Pleuronectòids all the fin-rays are articulated, and in many of them the pelvic fins are 6-rayed, with the anterior ray simple. I am unable to confirm Boulenger's statement that an additional ray is present in *Hippoglossus*, and it is clear to me that the anterior pelvic ray of this and other genera with 6-rayed pelvic fins corresponds to the spine of *Psettodes*, and that the formation of joints in response to mechanical requirements has reconverted spines into articulated rays in the dorsal and pelvic fins of the Heterosomata, as in the case of the epaxial rays of the homocercal caudal fin [*].

Thilo [†] and Boulenger [‡] consider that the Zeidæ are nearly related to the Heterosomata; I cannot find any anatomical evidence in support of this idea. I much more readily subscribe to Boulenger's view that the Upper Eocene *Amphistium* is allied to the symmetrical ancestor of the flat-fishes, for in my opinion this fish is a Percoid, which should probably be placed in the family Scorpididæ near the existing *Psettus*, or may perhaps be related to *Platax*. Thanks to the courtesy of Dr. Smith Woodward, I have been able to examine two examples of *Amphistium paradoxum* in the B Museum. The caudal fin has 17 principal rays, 15 o are branched, in addition to a few graduated rays abo below; the pelvic fin, preserved only in the Monte Bolca specimen, is formed of a spine and, in my opinion, 5 soft rays, for I cannot see a greater number inserted on the pelvic bone which lies uppermost, the outlines of which are fairly distinct.

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[*] Regan, Ann. & Mag. Nat. Hist. (8) v. 1910, p. 357.

[†] Zool. Anz. 1902, pp. 305–320.

[‡] Ann. & Mag. Nat. Hist. (7) x. 1902, pp. 295–304.

Boulenger's restoration shows several features of *Psettodes* or *Zeus* rather than *Psettus* which I am unable to see in the fossils; thus he shows the lower jaw nearly as long as the head and the præoperculum vertical and scarcely curved, whereas the lower jaw appears to me only a little more than half the length of the head, and the præoperculum to have a distinct lower limb; also the origin of the anal fin is not so far forward in the actual fossils as it is in the restoration.

Bothus and *Solea* were already in existence in the Upper Eocene, and, indeed, the whole Upper Eocene fish-fauna is strikingly modern, so that there is no reason to regard *Amphistium* as ancestral to the flat-fishes on account of its occurrence in the Upper Eocene.

The researches of Parker * on the optic chiasma are of great importance for the classification of the Heterosomata. He found that in various symmetrical Teleosts the left nerve crossed above the right about as frequently as the right above the left; this was also the case in flat-fishes of the family Soleidæ as recognized by Jordan and Evermann †, whether dextral (*Solea, Achirus*) or sinistral (*Symphurus*). From this dimorphism of the chiasma it follows that in the Soleidæ the optic nerves are partly uncrossed when the nerve of the migrating eye is dorsal, and that they almost cross each other twice when it is ventral. In other flat-fishes, whether dextral (*Psettichthys, Atheresthes, Parophrys, Pleuronectes*, &c.) or sinistral (*Paralichthys, Platophrys, Citharichthys*,&c.), Parker found that it was always the case that the nerve of the migrating eye was dorsal, the only exception being in the case of reversed examples, *i. e.* sinistral members of dextral species or dextral members of sinistral species, in which that nerve was dorsal which was normally dorsal in the genus. In a few species of the Pacific coast of North America sinistral and dextral individuals are equally numerous; but in a species of a sinistral genus, such as *Paralichthys californicus*, the nerve of the right eye is always dorsal, whether the individual be sinistral or dextral; similarly, in a species of a dextral genus, such as *Platichthys stellatus*, the nerve of the left eye is dorsal. This monomorphism of the optic chiasma is obviously a specialization, which Parker considers has been arrived at on account of its mechanical advantage, and he draws the deductions that the Soleidæ are a natural group and that they have evolved from more generalized flat-fishes than those with a monomorphic chiasma.

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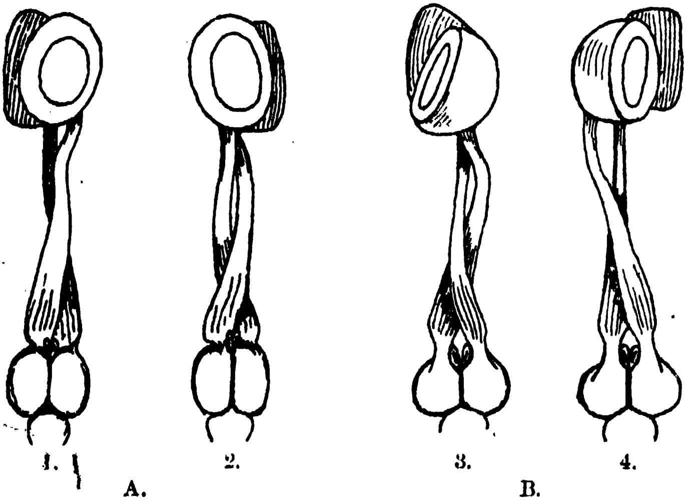
* Bull. Mus. Comp. Zool. xl. pp. 219-242 (1903).

† Bull. U.S. Nat. Mus. xlvii. pt. iii. pp. 2602-2712 (1898).

Parker did not examine *Psettodes*. I find that in two sinistral examples of this monotypical genus the right nerve is dorsal in one, ventral in the other; this establishes that the chiasma is dimorphic, and it appears to me that in all probability the presence of sinistral and dextral individuals in equal numbers is primitive and is of another nature from the phenomena observed in some species of *Paralichthys* and *Platichthys*.

Fig. 2.



Dorsal views of anterior parts of brains with cerebral hemispheres removed, showing eyeballs, optic nerves, and optic lobes. (After Parker).

A. *Paralichthys californicus*, sinistral species, with nerve of right eye dorsal. 1, sinistral individual; 2, dextral individual.

B. *Platichthys stellatus*, dextral species, with nerve of left eye dorsal. 3, sinistral individual; 4, dextral individual.

Kyle * has written a valuable paper on the classification of the Heterosomata, and has used some new characters without quite appreciating their full importance. Adopting Jordan and Evermann's two families, Pleuronectidæ and Soleidæ, he has found that in the former the nasal organ of the blind side has accompanied or followed the eye in its migration, and lies nearly on the edge of the head, whereas in the latter the nasal organs are placed symmetrically; this confirms Parker's ideas as to the Soleidæ, and I may mention that, although in *Psettodes* the nasal organs are not quite symmetrical, they are very nearly so.

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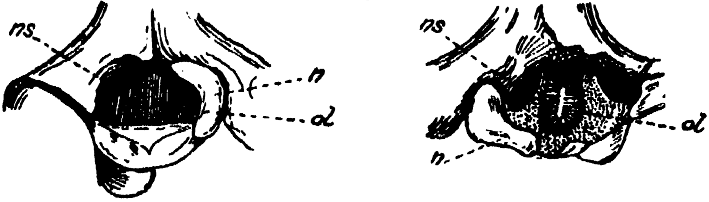
* Rep. Fisheries Board Scotland, xviii. 1900, pp. 335–368, pls. xi.–xii.

Kyle has also found that in *Psettodes*, the sinistral Pleuronectoids, and the Soleidæ the olfactory laminæ radiate from or are arranged transversely to a median rachis, as in most Teleosts, whereas in the dextral Pleuronectoids (except the Soleidæ) the laminæ are parallel and there is no rachis. Unfortunately Kyle's researches preceded Parker's, which would perhaps have given him the idea of the primary importance of sinistrality and dextrality, in spite of reversed examples, and might have led him to utilize the differences in the structure of the pelvic fins for the definition of subordinate groups only.

Fig. 3.



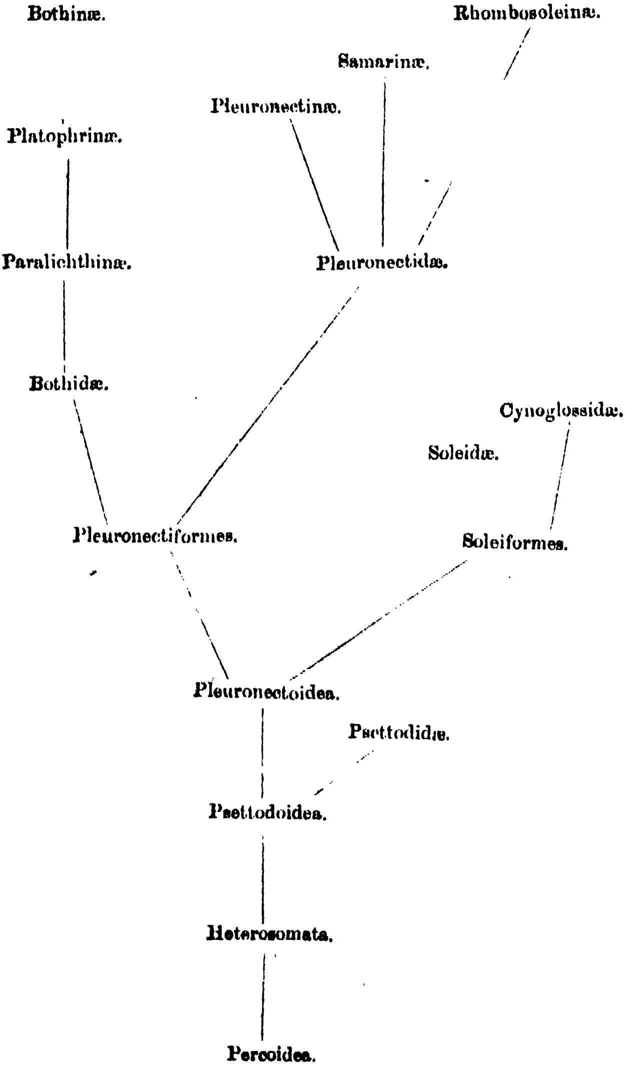
A. B.

Nasal organ of eyed side of (A) Halibut (*Hippoglossus hippoglossus*) and (B) Turbot (*Bothus maximus*). (After Kyle.)

ol, olfactory laminæ; *ns*, nasal sacs; *n*, nasal bones.

The distinctness of the sinistral and dextral Pleuronectiformes from each other is shown not only by the structure of the olfactory organs and the monomorphism of the optic chiasma, but also by the eggs. Those of *Hippoglossus*, *Hippoglossoides*, *Pleuronectes*, *Microstomus*, and *Glyptocephalus* are known to have an undivided yolk without oil-globule; whilst those of *Paralichthys*, *Citharus*, *Platophrys*, *Arnoglossus*, *Bothus*, *Lepidorhombus*, *Phrynorhombus*, and *Zeugopterus* are distinguished by the presence of a single oil-globule in the yolk. The egg of *Solea* differs again, having a number of small oil-globules at the surface of the yolk.

I venture to think that it is fairly certain that from some form not very unlike *Psettodes* the two groups typified by the plaice and the sole have arisen, and that each of these has split into two series, a sinistral and a dextral. These conclusions are embodied in the following classification, and may be expressed diagrammatically thus :—



Order HETEROSOMATA.

Asymmetrical, with both eyes on one side. Body strongly compressed, with the præcaudal region short; dorsal and anal fins long; caudal fin with 17 principal rays (15 branched) or fewer; pelvic fins 6-rayed or less, thoracic or jugular, with the pelvic bones directly attached to the cleithra. Air-bladder absent in the adult. Mouth more or less protractile, bordered above by the præmaxillaries only. Parietals separated by the supra-occipital; interorbital bar mainly formed by the frontal of eyed side; frontal of blind side extending to præfrontal external to upper eye; no orbito-sphenoid. Pectoral arch attached to skull by a forked post-temporal; no mesocoracoid. Vertebral column of solid centra coossified with the arches; posterior præcaudal vertebræ with downwardly directed parapophyses.

Suborder 1. PSETTODOIDEA.

Dorsal fin not extending forward on the head; anterior dorsal rays spinous; each pelvic fin of a spine and 5 soft rays. Maxillary with a well-developed supra-maxillary bone; palatines toothed; urohyal normal, the lower edge scarcely curved. Two post-cleithra on each side. Vertebræ 24 (10+14). Species with sinistral and dextral individuals equally numerous and with the optic chiasma dimorphic.

Family 1. **Psettodidæ.**

Pelvic fins nearly symmetrical in form and position, posterior to the cleithra. Mouth large, with strong pointed teeth; jaws and dentition equally developed on both sides. Nasal organ of blind side scarcely higher than the other; olfactory laminæ arranged transversely to or radiating from a central rachis. Præcaudal parapophyses downwardly directed and united to form closed hæmal arches; pectoral radials well developed.

A single species, *Psettodes erumei*, ranging from West Africa to China. It has no gill-rakers, and the strongly toothed mouth is larger than in any other flat-fish; this is evidently a predaceous fish, which probably lies on the bottom concealed from its prey, and then darts out, swimming pidly for a short distance by lateral movements of the tail. Probably it has retained so many Percoid features because it has not adopted progression by undulating movements of the body and marginal fins to the same extent as other fishes of this order.

Suborder 2. PLEURONECTOIDEA.

Dorsal fin extending forward on the head at least to above the eye; all the fin-rays articulated; each pelvic fin of 6 or fewer rays. No supramaxillary bone; no palatine teeth; lower edge of urohyal deeply emarginate, so that the bone appears forked. On each side a single post-cleithrum or none. Vertebræ never fewer than 28 (9+19).

Division 1. *PLEURONECTIFORMES.*

Mouth usually terminal, with the lower jaw prominent; præoperculum with free margin. Nasal organ of blind side near edge of head. Optic chiasma monomorphic, the nerve of the left eye in dextral forms and that of the right eye in sinistral forms always dorsal. A post-cleithrum; ribs present.

Family 1. **Bothidæ.**

Sinistral, except for reversed examples in certain species. Nerve of the right eye always dorsal. Olfactory laminæ arranged transversely to, or radiating from, a central rachis. Egg with a single oil-globule in the yolk. Pectoral radials present.

Subfamily 1. *PARALICHTHINÆ.*

Pelvic fins short-based, supported by the pelvic bones and situated behind the cleithra, either symmetrical or with the fin of the eyed side nearly median in position. Vertebræ 33–41 (9–12+24–30); most or all of the parapophyses in the præcaudal region downwardly directed, united or connected by bridges to form closed hæmal arches; caudal vertebræ without transverse apophyses.

Principal genera:—*Tephritis, Verasper, Hippoglossina, Lioglossina, Xystreurys, Paralichthys, Pseudorhombus, Ramularia, Ancylopsetta, Notosema, Gastropsetta, Cyclopsetta, Syacium, Azevia, Citharus, Citharichthys, Thysanopsetta, Etropus,* from tropical and temperate seas.

In most the mouth is moderately large, with the jaws and dentition nearly equally developed on both sides; but in the small-mouthed *Etropus* the jaws of the blind side are curved and are much more strongly toothed than those of the eyed side.

I have examined the skeletons of *Paralichthys* (vertebræ 10+24), *Pseudorhombus* (10+27), *Citharichthys* (11+28), and *Syacium* (10+25).

Subfamily 2. *PLATOPHRINÆ.*

Pelvic fin of blind side short-based; pelvic fin of ocular side elongate, extending forward to the urohyal, supported by a cartilaginous plate placed in advance of the cleithra. Vertebræ 37–43 (9–10 + 27–33); parapophyses in præcaudal region connected or united as in the Paralichthinæ; caudal vertebræ with well-developed transverse apophyses.

Principal genera:—*Arnoglossus*, *Anticitharus*, *Chascanopsetta*, *Pelecanichthys*, *Scæops*, *Engyprosopon*, *Læops*, *Monolene*, *Trichopsetta*, *Platophrys*, *Lepidopsetta*, *Lophonectes*, from tropical and temperate seas.

In the small-mouthed *Læops* the jaws and dentition are unequally developed on the two sides, just as in *Etropus*.

I have examined skeletons of *Arnoglossus* (vertebræ 10 + 33), *Platophrys* (10 + 29), and *Lophonectes* (10 + 31).

Subfamily 3. *BOTHINÆ.*

Both pelvic fins elongate, extending forward to the urohyal, supported by cartilaginous plates placed in advance of the cleithra. Vertebræ 35–41 (9–12 + 25–31); parapophyses in precaudal region separate; caudal vertebræ with well-developed transverse apophyses. Jaws and dentition equally developed on both sides.

Genera:—*Bothus*, *Lepidorhombus*, *Zeugopterus*, and *Phrynorhombus*, from the North Atlantic and Mediterranean.

I have examined skeletons of *Bothus* (vertebræ 11 + 25), *Lepidorhombus* (9 + 31), *Zeugopterus* (9 + 26), and *Phrynorhombus* (10 + 26).

Family 2. **Pleuronectidæ.**

Dextral, except for reversed examples in certain species. Nerve of the left eye always dorsal. Olfactory laminæ slightly raised, parallel, without rachis. Egg without oil-globules.

Subfamily 1. *PLEURONECTINÆ.*

Anterior part of dorsal fin posterior to nasal organ of blind side; pelvic fins short-based, supported by the pelvic bones posterior to the cleithra, similar in form and symmetrical, or the fin of the eyed side median. Pectoral radials present; hypocoracoids narrowed forward below. Vertebræ 35–65 (10–16 + 23–52); præcaudal parapophyses separate, divergent.

The principal genera may be arranged thus :—

A. Mouth large, with the jaws and dentition nearly equally developed on both sides. Vertebræ 40–50 (10–16 + 29–37).

Hippoglossus, *Atheresthes*, *Platysomatichthys*, *Hippoglossoides*, *Psettichthys*, *Eopsetta*, and *Liopsetta*, from arctic and northern seas.

B. Mouth small, asymmetrical, the jaws and dentition more developed on the blind side. Vertebræ 35–65 (10–14 + 23–52).

Pleuronichthys, *Parophrys*, *Isopsetta*, *Limanda*, *Pleuronectes*, *Platichthys*, *Microstomus*, *Glyptocephalus*, &c., from arctic and northern seas, with *Pœcilopsetta*, *Boopsetta*, and *Nematops*, from the Indo-Pacific.

I have examined specimens of *Hippoglossus* (vertebræ 16 + 34), *Hippoglossoides* (13 + 31), *Psettichthys* (10 + 32), *Pleuronectes* (10–11 + 24–30), *Parophrys* (13 + 24), and *Microstomus* (12 + 36–37).

Subfamily 2. SAMARINÆ.

Dorsal fin extending forward on snout either above or below nasal organ of blind side ; pelvic fins supported by the pelvic bones behind or below the cleithra, asymmetrical, that of the eyed side median and somewhat advanced. Pectoral radials present; hypocoracoids expanded. Vertebræ 31 (10 + 21) ; præcaudal parapophyses united to form closed hæmal arches bearing the slender ribs at their extremities. Mouth symmetrical, with the jaws and dentition nearly equally developed on both sides.

Genera :—*Paralichthodes*, *Brachypleura*, and *Samaris*, from the Indo-Pacific.

Well distinguished externally from the Pleuronectinæ with symmetrical mouth by their form, the absence of a distinct caudal peduncle, the extension forward of the dorsal nearly to the end of the snout, and the asymmetrically placed pelvic fins, these three genera form a natural and well-marked group. *Paralichthodes* differs from the others in that the nostrils of the blind side appear below instead of just above the anterior part of the dorsal fin, and *Samaris* is distinguished by the more extended bases of the pelvic fins.

I have examined the skeleton in *Brachypleura*.

Subfamily 3. *RHOMBOSOLEINÆ.*

Dorsal fin extending forward on snout above nasal organ of blind side; pelvic fins formed as in the Platophrinæ, that of the eyed side median, extending forward to the urohyal, supported by a cartilaginous plate in advance of the cleithra; that of the blind side small or sometimes absent. No pectoral radials, the rays inserted on the hypercoracoid; hypocoracoids narrowed forward below. Vèrtebral column formed as in the Pleuronectinæ, the præcaudal parapophyses not united. Mouth asymmetrical; jaws of the blind side strongly curved, those of the eyed side toothless.

Genera:—*Rhombosolea*, *Ammotretis*, and *Peltorhamphus* from Southern Australia and New Zealand, with *Oncopterus* from Patagonia.

I have examined the skeleton in *Rhombosolea* (vertebræ 10+21) and *Peltorhamphus* (9+27).

Division 2. *SOLEIFORMES.*

Mouth small, terminal, subterminal, or inferior, the lower jaw never prominent; jaws of the blind side toothed, strongly curved, the convexity of the lower fitting the concavity of the upper; jaws of the eyed side not or but feebly toothed; præopercular margin not free. Nasal organs symmetrical in position; olfactory laminæ arranged transversely to or radiating from a central rachis. Optic chiasma dimorphic, the right or the left nerve dorsal without reference to dextrality or sinistrality. No post-cleithrum; no pectoral radials, the rays inserted on the hypercoracoid; hypocoracoid reduced; pelvic fins supported by the pelvic bones, which are dependent from the lower extremities of the cleithra, which do not reach the ventral profile; præcaudal parapophyses united or connected by a bridge to form closed hæmal arches; no ribs.

Family 1. **Soleidæ.**

Dextral. Caudal fin separate or not; pectorals often present; both pelvic fins usually developed, but that of the blind side sometimes vestigial or absent, that of the eyed side sometimes median, with extended base. Vertebræ 28–57 (9–10+19–48).

Principal genera:—*Solea*, *Synaptura*, *Æsopia*, *Achirus*, *Pardachirus*, *Liachirus*, *Gymnachirus*, *Apionichthys*, mostly from the sandy shores of tropical and temperate seas; many species enter rivers and some are permanently fluviatile.

I have examined skeletons of *Solea* (vertebræ 9–10 + 31–41), *Synaptura* (9 + 41–48), *Achirus* (9 + 20), *Pardachirus* (10 + 27), and *Liachirus* (10 + 23). *Achirus* is certainly generically distinct from *Solea*, but there are no structural characters which entitle it to rank as the type of a distinct subfamily, as in Jordan and Evermann's classification.

Family 2. **Cynoglossidæ.**

Sinistral. Vertical fins confluent; no pectorals; pelvic fin of blind side present, 4-rayed, median in position, that of eyed side displaced upwards and reduced, or entirely wanting; pelvic bone of the reduced or absent fin much smaller than the other. Vertebræ 47–65 (9–10 + 38–56).

Principal genera:—*Symphurus*, *Paraplagusia*, *Cynoglossus*, from tropical and temperate seas.

I have examined skeletons of *Symphurus* (vertebræ 9 + 40), *Paraplagusia* (9 + 43), and *Cynoglossus* (9 + 56). The skeleton is strikingly similar to that of the Soleidæ, and there can be no doubt that the two families are closely related; as in *Achirus* and other Soleid genera without pectoral fins, the coracoid bones are absent.

LV.—*New* Unionidæ *from East Asia.* By Dr. F. Haas, Senckenberg Museum, Frankfurt-a.-M.

In preparing a continuation of Küster's Monograph of *Unio* in the 'Martini-Chemnitzsches Conchyliencabinet' I examined a large number of shells, which, for the greater part, belonged to the Senckenberg Museum or were purchased from Messrs. Sowerby and Fulton, Kew, and Mr. H. Rolle, Berlin. The East-Asiatic Unionidæ of the Zoological Museum of Berlin were also at my disposal. Among all these shells I found the following new species and subspecies, the types of which, with the only exception of *Nodularia undulata*, belonging to the Berlin Museum, are in the collection of the Senckenberg Museum, and which I shall figure in my monograph mentioned above.

1. *Nodularia densērugata*, sp. n.

Shell elongate-elliptical, rather solid and inflated, rounded in front, distinctly biangulate behind. Posterior ridge rather high, rounded. Basal margin almost straight. Beaks not prominent, situated at $\frac{26}{100}$ of the total length, greatly eroded; their sculpture covers the greatest part of the disk and consists of concentrical, wavy wrinkles standing very close. Epidermis of a dull blackish grey. Hinge consisting of two cardinals and two laterals in the left, one cardinal and one lateral in the right valve. Cardinals rather solid, stumpy, that of the right valve accompanied in front by a low lamellar auxiliary tooth. Laterals nearly straight, high. Interval short, rather smooth. Anterior cicatrices distinct, deep; posterior distinct and very faint. Dorsal cicatrices united to a narrow groove situated at the inner side of the interval. Beak-cavities rather deep. Nacre silvery.

Length 53, height 26, diam. 18 mm.

Hab. Hainan. Collected by Mr. B. Schmacker.

Four specimens in the Senckenberg Museum.

2. *Nodularia continentalis*, sp. n.

Shell elongate-elliptical, solid, inflated, somewhat truncated in front and slightly arcuate behind. Posterior ridge moderate, rounded. Basal margin slightly sinuate at its posterior part. Beaks not prominent, eroded, situated at $\frac{21}{100}$ of the total length; their sculpture is not to be seen when adult, in young shells it consists of few concentrical, slightly looped ridges, the posterior loops running upwards across the posterior slope. Epidermis of a rather dull black. Hinge consisting of two cardinals and two laterals in the left, one cardinal and one lateral in the right valve. Cardinals solid, stumpy, jagged on the surface, a narrow lamellar auxiliary tooth standing in front of the one of the right valve. Laterals long, high and curved. Interval short, broad, covered with small denticular structures. Anterior cicatrices distinct, deep; posterior distinct, faint. Dorsal cicatrices united to a narrow short groove situated at the inner side of the interval. Beak-cavities deep. Nacre silvery, brilliant.

Length 62, height 36, diam. 25 mm.

Hab. Hunan, Middle China. Collected by Dr. O. v. Moellendorff.

Two specimens in the Senckenberg Museum.

Very near to *Nod. japanensis*, Lea, of Japan, the first form of this group recorded from the continent.

3. *Nodularia undulata*, sp. n.

Shell rhomboid-elliptical, rather thin and moderately inflated, rounded in front and nearly vertically truncated behind. Posterior ridge high, distinctly angulated. Basal margin straight or slightly curved. Beaks somewhat prominent, situated at $\frac{23}{100}$ of the total length; their sculpture consists of concentrical, undulated ridges, covering about one-half of the disk, and running upwards and backwards across the posterior slope. Epidermis of a yellowish green, shining. Hinge consisting of two cardinals and two laterals in the left, one cardinal and one lateral in the right valve. The cardinals are solid, lamellated, that of the right valve accompanied in front by a very low lamellar auxiliary tooth. Laterals long, straight. Interval short, broad, not distinctly separated from the cardinal teeth. Anterior cicatrices distinct, deep; posterior distinct, faint. Dorsal cicatrices united to a groove situated at the inner side of the interval. Beak-cavities shallow. Nacre silvery, brilliant.

Length 43, height 25, diam. 16 mm.

Hab. Pisui, Hainan. Collected by Mr. Schöde.

Two specimens in the Senckenberg Museum; five specimens, including the type, in the Berlin Museum.

4. *Ptychorhynchus lævis*, sp. n.

Shell elongate-elliptical, subsolid, rather compressed, rounded in front, bluntly pointed behind about the middle of the height. Posterior ridge low, rounded angulate, basal margin regularly curved. Beaks somewhat prominent, situated at $\frac{29}{100}$ of the total length; their sculpture is invisible on account of erosion. Epidermis smooth, shining, of a blackish brown, with darker lines of growth. Hinge consisting of two cardinals and vestiges of two laterals in the left, one cardinal and vestiges of one lateral in the right valve. Cardinals high, the one of the right valve pyramidal, the anterior one of the left valve smaller and lower than the posterior one almost triangular. Laterals very short, low, only indicated, interval long, narrow and smooth. Anterior cicatrices deep, rough, that of the anterior adductor and that of the anterior retractor confluent. Posterior cicatrices distinct, faint. Dorsal cicatrices united to a narrow groove situated at the inner side of the interval. Beak-cavities shallow. Nacre reddish, bluish at the margin, not brilliant.

Length 59, height 31, diam. 16 mm.

Hab. Saghalin Island. Collected by Admiral Keppel.

Two specimens in the Senckenberg Museum, presented by Messrs. Sowerby and Fulton.

5. *Cristaria inangulata*, sp. n.

Shell short-elliptical, nearly unwinged, rather thin and inflated, rounded in front and behind. Posterior ridge rounded, low. Basal margin regularly curved. Beaks not prominent, situated at $\frac{35}{100}$ of the total length, with low wide ridges grouped round an apical protuberance, the first ones doubly looped, the following ones becoming slightly undulate. Epidermis greenish brown, shining, rayed. Hinge consisting of a single, low, lamellar præumbonal, and a single, low, nearly reduced, postumbonal claustrum in each valve. Anterior cicatrices faint, that of the anterior adductor and that of the anterior retractor confluent. Posterior cicatrices confluent, faint. 2–3 dorsal cicatrices lying in a row, often united to a groove, situated under the beaks. Beak-cavities shallow. Nacre reddish, bluish towards the edge.

Length 99, height 59, diam. 39 mm.

Hab. Tonkin. Collected by Mr. Messager.

Four specimens in the Senckenberg Museum, purchased from Mr. H. Rolle.

6. *Anodontites lautus tumens*, subsp. n.

A highly inflated form of *A. lautus*, Marts., characterized by the strong ridges of the beak-sculpture, which, on the upper part of the disk, become very high and nearly terrace-shaped. There exist all the intermediate stages between the type form and this subspecies.

Hab. Yamashiro, Japan.

Three specimens in the Senckenberg Museum, presented by Messrs. Sowerby and Fulton.

7. *Cristaria discoidea sautteri*, subsp. n.

Differs from typical *discoidea* by the strongly developed claustra, which are double in the left valve in their præumbonal as well as in their postumbonal portion.

Hab. Lake Candidins, Formosa. Collected by Mr. Sautter.

Three specimens with the animals preserved in alcohol and three pairs of shells in the Senckenberg Museum.

8. *Nodularia douglasiæ crassidens*, subsp. n.

Among the typical specimens of *N. douglasiæ* of nearly all localities, there occur heavy inflated shells with extremely thick and deeply jagged cardinals and strong curved laterals, upon which I bestow the subspecific name of *crassidens*. I have examined specimens from Hainan, from Hunan, and from Ningpo, Northern China.

LVI.—*On Mammals collected in Ceará, N.E. Brazil, by Fräulein Dr. Snethlage.* By OLDFIELD THOMAS.

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I OWE to the kindness of Fräulein Dr. E. Snethlage, Director of the Goeldi Museum, Para, the opportunity of working out a number of small mammals collected by her in Ceará, a district as yet almost untouched by collectors. Thirteen species are represented, of which two are new.

The localities where Fräulein Snethlage worked were two:—(1) Ibu, a "cidade" in the north of Ceará, the last station on the Sobral railway, situated at an altitude of about 300 metres, at the foot of the Serra de Ibiapaba, which rises immediately west of it.

(2) S. Paulo, on the top of the Serra, at about 900 metres. The Serra is a high sandstone plateau with a steep margin on the Ceará side; it is said to extend far into Piauhy.

A series of duplicates, and the types of the two new species, have been presented to the British Museum by the authorities of the Goeldi Museum.

1. *Callithrix jacchus*, L.

♂. 5, 13; ♀. 1, 2, 3 (juv.), 6, 7, 8, 14. Ipu, Ceará.

The coloration of the nape in these marmosets is very variable, some being grey and others whitish. The latter represent Spix's *albicollis*.

2. *Artibeus jamaicensis lituratus*, Ill.

♂. 26. S. Paulo, Serra de Ibiapaba.

3. *Vampyrops lineatus*, Geoff.

♂. 30, 31. S. Paulo, Serra de Ipiapaba.
♂. 60, 63; ♀. 61, 62. Ipu.

4. *Hemiderma perspicillatum*, L.

♀. 56. S. Paulo, Serra de Ibiapaba.

5. *Holochilus sciureus*, Wagn.

♂. 54. S. Paulo, Serra de Ibiapaba.

6. *Rhipidomys cearanus*, sp. n.

♀. 50. Serra de Ibiapaba.

Very like the Guianan *R. nitela*, Thos., agreeing with it in size, the general dull fawn-colour, and white belly, but the hands are wholly brown above, and the feet are also completely brown, except a narrow light line along the hallucal border and on the tips of the toes. Tail less heavily haired than in *nitela*, scarcely tufted at all.

Skull with the mesopterygoid fossa narrow, parallel-sided, not broadened anteriorly, penetrating the palate as far as the level of the front of m^3; parapterygoid fossæ flat, their outer border not raised, and their floor not excavated as is the case in *R. nitela*. Molar series rather longer than in *nitela*.

Dimensions of the type (measured in the flesh):—

Head and body 101 mm.; tail 128, hind foot 26; ear 18.

Skull: greatest length 29·5; basilar length 22·5; nasals 9·6; interorbital breadth 4·8; breadth of brain-case 13·6; palatilar length 11·4; palatal foramina 6·3 × 2·7; upper molar series 4·9.

Type. Young adult female. Original number 50. Collected 8th February, 1910.

This *Rhipidomys* is readily distinguished from *R. nitela* by its darker feet and the different structure of its posterior narial region. No other species seems to be nearly related to it.

"Taken in a house."—*E. S.*

7. *Oryzomys subflavus*, Wagn.

♂. 4; ♀. 21. Ipu.

♂. 45, 48, 51; ♀. 39, 52, 57, 76, 77, 79. Serra de Ibiapaba.

"Rato vermelho."—*E. S.*

8. *Oryzomys* sp.

♀. 19. Ipu.

O. eliurus group.

9. *Zygodontomys lasiurus*, Lund.

♂. 15. Ipu.

♂. 25, 29, 32, 35, 36, 38; ♀. 27, 28, 33, 34, 37. Serra de Ibiapaba.

"Native name 'Pishúna.' Very common in the maize-fields."—*E. S.*

10. *Kerodon spixi*, Wagl.

♀. 23. Ipu.
♂. 43; ♀. 44. S. Paulo, Serra de Ibiapaba.

11. *Thrichomys laurentius*, Thos.

♂. 18, 24 (juv.); ♀. 22. Ipu.

This is the most northern locality recorded for the genus, which extends southwards to Paraguay. The typical series of *T. laurentius* was obtained by M. Robert near Pernambuco.

"Native name 'Rabúdo.' Trapped among rocks."—*E. S.*

12. *Peramys domesticus*, Wagn.

♂. 10; ♀. 17. Ipu.
♂. 53, 55, 59; ♀. 41, 42, 58, 65. Serra de Ibiapaba.

A wide-ranging species, specimens in the British Museum from Paraguay, Matto Grosso, Bahia, Pernambuco, and Ceará being practically identical.

One of the females is said by Fräulein Snethlage to have had twelve young attached to the mammæ.

"'Catita.' Lives in or near houses, and one that we caught in our work-room had made a nest of straw and paper under the boards."—*E. S.*

13. *Marmosa beatrix*, sp. n.

♂. 12; ♀. 64, 66. Ipu.

A small species allied to the S. Brazilian *M. microtarsus*.

Size about as in *M. microtarsus*, larger than in *pusilla* and *emiliæ*. Fur soft and fine; ordinary hairs of back about 55 mm. in length, the longer piles about 8 mm. General colour above greyish fawn, very much as in *M. marica*; sides, and especially sides of neck, more buffy. Under surface cream-colour, fairly sharply defined, the hairs in one specimen creamy to the base, in two others slaty at base on the belly, creamy throughout on the chest. Orbital rings well defined. Ears greyish. Hands and feet dull whitish. Tail pale grey, the hair of the body scarcely extending on to its base.

Skull most like that of *M. microtarsus*, but with a slight tendency to the development of postorbital processes; the brain-case broader and lower; bullæ smaller. Compared with that of *M. marica* the whole skull is lighter, the interorbital space narrower, and the brain-case flatter. Secator, both above and below, rather shorter than the premolar next in front of it.

Dimensions of the type (measured in flesh):—

Head and body 92 mm.; tail 125; hind foot 16; ear 19.

Skull: greatest length 27·2; basal length 24·4; greatest breadth 15; nasals 11×2·8; interorbital breadth 4·6; breadth of brain-case 11·2; palatal length 14·3; combined length of three molariform teeth 4·4; breadth across outer corners of m^3 8·5.

Type. Adult female. Original number 64. Collected 15th June, 1910.

This pretty little species has a considerable external resemblance to the *M. marica* of Merida, Venezuela, but is probably really most nearly allied to *M. microtarsus*, from which it differs by its paler colour and rudimentary postorbital processes. The variation in the coloration of the belly-hairs is unusual in this group.

"Catita pequeña."—*E. S.*

LVII.—*Four new South-American Rodents.*

By OLDFIELD THOMAS.

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Sciurus (*Microsciurus*) *similis fusculus*, subsp. n.

A lowland race of *S. similis*[*].

All characters as in *similis*, except that the olivaceous tone of the upper surface is replaced by blackish brown (darker than "vandyke-brown"), the fine rings on the hairs, buffy in *similis*, reduced in prominence and tending towards tawny. On the face and sides this alteration from buffy to tawny or tawny ochraceous is particularly evident. Colour of chest also rather "tawny ochraceous" than "ochraceous," as it is in *similis*.

Dimensions of the type (measured in the flesh):—

Head and body 126 mm.; tail 108; hind foot (s. u.) 33; ear 13·5.

Hab. Chocó, W. Colombia. Type from Juntas, Rio San Juan. Alt. 400′.

Type. Adult male. B.M. no. 10. 7. 16. 2. Original number 141. Collected 27th February, 1909, by Mervyn G. Palmer. Two specimens.

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[*] Nelson, Bull. Am. Mus. N. H. xii. p. 78 (1899).

This squirrel is very like the Cali *S. similis*, of which four topotypes, also collected by Mr. Palmer, are in the Museum collection. But that is a comparatively highland form (5800′–6000′), and the specimens show a uniformly olivaceous tint, recognizably distinct from the brown colour of the coast animal.

Œcomys rex, sp. n.

A large species, with much developed supraorbital ridges.

Size equalling that of the largest known species, *Œ. catharinæ*. General appearance very much as in that animal. Colour above rich tawny rufous, approaching ferruginous, considerably blackened on the posterior back, bright and clear on the nape and flanks. Under surface dull whitish, not very sharply defined laterally, the hairs pale slaty for their basal two-thirds. Head like body, without darker markings. Proectote of ear blackish. Forearms like sides; hands brown on metacarpus, the fingers abruptly white; hind feet proportionally very short, brown on the metatarsus, white along the hallucal edge and on the toes. Tail well-haired but not tufted; uniformly dark brown as usual. Mammæ 2—2=8.

Skull broadly built and remarkable for the great development of the supraorbital ridges, which form broad ledges over the orbits, develop marked angular postorbital projections, and pass backwards across the parietals to the outer corners of the interparietal. Nasals narrow. Interorbital region concave between the ridges. Anterior plate of zygoma-root projected forward, as in *Œ. catharinæ*. Palatal foramina of medium length.

Dimensions of the type (measured in skin):—

Head and body 152 mm.; tail 158; hind foot (wet) 26; ear (wet) 16.

Skull: greatest length 33; basilar length 26·3; nasals 11; interorbital breadth 6; breadth across postorbital processes 13·5; breadth of brain-case 15·5; palatilar length 14·6; palatal foramina 6·4; upper molar series 5·5.

Hab. R. Supinaam, Lower Essequibo, Demerara.

Type. Old female. B.M. no. 10. 9. 29. 17. Collected by Cozier and presented by F. V. McConnell, Esq.

This handsome species is readily distinguishable from all others by the great development of its supraorbital ridges and postorbital projections, which recall those found in *Tylomys* and *Lenomys*. Its nearest relation would seem to be the South-Brazilian *Œ. catharinæ*, which shares with it the forward projection of the anterior zygoma-root, otherwise not found in *Œcomys*.

The type specimen has been presented by Mr. McConnell to the Museum with a further consignment of mammals from the River Supinaam, whence came the collection of which I gave a list in a previous number of the 'Annals.' Several additional species are now included, of which *Myoprocta acouchy*, *Coendou prehensilis*, *Peramys brevicaudatus*, and *Ateles paniscus* are particularly welcome accessions to the Museum collections.

Œcomys nitedulus, sp. n.

A small species allied to *Œ. rosilla* and *paricola*.

Colour above quite of the same rich greyish tawny as in *Œ. rosilla*, the rump similarly more tawny than the fore back. Under surface white, sharply defined laterally, the hairs white to the roots. Ears brown. Hands and feet dull buffy. Tail uniformly brown above and below.

Skull as in *Œ. rosilla*, the tooth-row shorter than in *Œ. paricola*.

Dimensions of the type (measured in the flesh):—

Head and body 118 mm.; tail 125; hind foot 23.

Skull: greatest length 29; basilar length 22·3; breadth of brain-case 13·3; palatilar length 11·8; palatal foramina 5·2; upper molar series 3·7.

Hab. Demerara. Type from the Lower Essequibo, 13 miles from mouth.

Type. Adult female. B.M. no. 6. 4. 8. 31. Collected 29th March, 1906, by S. B. Warren, and presented by Oldfield Thomas. Three other specimens from the same region presented by F. V. McConnell, Esq.

This species is quite like the Orinoco *Œ. rosilla* above, but the under surface is without the marked ochraceous wash characteristic of that animal. *Œ. paricola*, which also has a white belly, is duller in tone above, has black ears, and a longer tooth-row.

Dasyprocta variegata yungarum, subsp. n.

General colour above more tawny brown than in true *variegata*, the yellow rings on the hairs replaced by "tawny" on the back, becoming laterally more "tawny ochraceous." Under surface more yellowish, the whole breadth of the chest and the middle line of belly for a breadth of about an inch brilliant "orange-ochraceous," the hairs greyish at their extreme bases. Muzzle, ears, and nape grizzled tawny brown, like back. Long rump-hairs black, the light ends, when (as in the young specimen) not worn off, dull ochraceous buff. Inner aspect of upper arms and thighs ochre-yellow. Hands and feet black, with a few fine tawny tickings.

Dimensions of the type (measured in flesh):—

Head and body 560 mm.; tail 25; hind foot 127; ear 51.

Skull: greatest length 116; basilar length 90; nasals 41 × 19·6; upper molar series (crowns) 17·5.

Hab. Yungas, Bolivia. Type from Chimosi, alt. 1700 m. A younger specimen from Puente de Choculo, 1200 m.

Type. Old male. B.M. no. 1. 6. 7. 63. Original number 1342. Collected 31st January, 1901, by Perry O. Simons. Presented by Oldfield Thomas.

The Agoutis which have been named *D. variegata*, *D. isthmica*, and *D. colombiana* appear to me to be referable to one species only, with several geographical subspecies. In Central America the ends of the long rump-hairs are broadly yellowish, like those of the rest of the body (*D. v. isthmica*); then in Colombia and Ecuador the rump-hairs are more or less white-tipped, the general body-colour being often a more intense yellow or even ochraceous (*D. v. colombiana*). Then in Peru the light tips to the rump-hairs are again yellowish, but are much narrower than in *isthmica*, and are often entirely worn off. Tschudi himself speaks of the tips as whitish, but this is probably due to the rest of the animal being a stronger ochraceous.

Finally, in Bolivia the representative form has a much darker and more tawny body-colour and the under surface is of the brilliant orange-ochraceous above described.

LVIII.—*New Genera of Australasian* Muridæ. By OLDFIELD THOMAS.

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ON attempting to arrange the Australasian Muridæ hitherto referred to "*Mus*" in genera of a more modern character, I find that certain peripheral species stand out at once as so different from all others as to need removal from *Mus* or *Epimys* before any idea of the characters of the great majority of the species can be gained. Such are

CYROMYS, g. n.

Size very large. Tail naked. Mammæ 0—2=4.

Skull large, heavy, with well-marked postorbital processes distinct from and below the ordinary crown-ridges, as in *Hyomys* and *Anisomys*. Palatal foramina short. Molars very much as in *Epimys*.

Range. New Guinea.

Type. *Cyromys imperator* (*Mus imperator*, Thos.). Other species *C. rex*.

A full account of the peculiarities of both species and figures of their skulls were given in 1888 *; and from these it may be readily seen how distinct these giant rats are from the ordinary *Epimys*. They would seem to have some distant relationship to the other large Australasian murines *Hyomys* and *Anisomys*, though the structure of the molars is less peculiar.

STENOMYS, g. n.

Size medium or small. Tail slender, of medium hairiness, about as in *Epimys* or rather less hairy. Feet slender, the metatarsus somewhat lengthened. Clitoris rather long. Mammæ (of type species) 1—2=6.

Skull scarcely ridged, low, smooth, with a long narrow muzzle. Interorbital edges square, the beads scarcely perceptible. Interparietal fairly large. Palatal foramina medium or small. Bullæ rather small.

Incisors rather more flattened in front than in *Epimys*. Molars as in that genus; m^3 without antero-external cusp (cusp 3).

Range. New Guinea.

Type. *Stenomys verecundus* (*Mus verecundus*, Thos. †). Other species *S. niobe* (*Mus niobe*, Thos.).

The typical species of this genus was only put with great doubt into *Mus* when I first described it, and I am now convinced it should not be assigned to the restricted *Epimys*. Its most distinctive characters are its slender feet and the long smooth muzzle of its skull, which is quite unlike that of ordinary rats.

S. niobe quite agrees in these respects with *S. verecundus*, but its mammary formula is as yet unknown.

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* P. Z. S. 1888, p. 479, pl. xxii.
† Nov. Zool. xi. p. 598 (1904).

BUNOMYS, g. n.

General characters, including shape of skull, very much as in *Stenomys*, but differing as follows:—

Fore claws elongated, fossorial. Clitoris extremely long, as long as the penis of an ordinary murine. Mammæ 0—2=4.

Interparietal much smaller. Palatine foramina rather short. Second molar with a small antero-external cusp. Upper incisors quite flat in front; lower incisors very slender, the gnawing section of unusual length.

Range. Celebes.

Type. Bunomys cœlestis (*Mus cœlestis*, Thos.*).

As with *Stenomys verecundus* the great peculiarity and doubtful generic position of this animal were noted in the original description, where a full account of it will be found. The genus is no doubt the Celebean representative of *Stenomys*.

LIX.—*New Neotropical* Geometridæ. By LOUIS B. PROUT, F.E.S.

[Concluded from p. 440.]

Bryoptera leucophaës, sp. n.

♀. 28 mm.—Face white, sparsely dotted with fuscous; palpus the same, dark fuscous externally; thorax and abdomen white, speckled with fuscous. Wings shining silvery white, sparsely and irregularly sprinkled with fuscous atoms, which are thickest at base, costa, inner-marginal half of median area, and distally to the postmedian from near costa to M^1; the lines sharply expressed, blackish; antemedian from one-fourth costa, curved, and with an indentation on SC; preceded by a less distinct interrupted brown line; cell-spot round, moderately large, blackish; a fine dark median line, angled on SC, outcurved round the cell-spot, then nearly vertical from M to inner margin; postmedian line from costa at about two-thirds subdentate to R^1, incurved and somewhat thickened to R^3, again incurved below, reaching inner margin at just before two-thirds; followed by some faint irregular brown shading, and with two thick elongate black marks between the radials just behind the sinus; subterminal line white, very ill-defined, some dark shading distally to it at costa, radials, and near inner margin; terminal spots black, rather large; fringe concolorous. Hind wing with the central shade proximal to cell-spot, diffuse and approximated to postmedian at inner margin, receding from it and becoming more slender towards costa, obsolete beyond cell; discal spot smaller than in fore wing; postmedian distinct, thickened at base of R^3 and M^1, followed by a large roundish blotch between radials, and a second near inner margin; subterminal indicated only by a scarcely interrupted series of dark spots which follows it; terminal line less broken into spots than on fore wing, yet strongly interrupted at the vein-ends. Underside white, both wings with small dark cell-spot, the fore wing in addition with traces of a postmedian line, and with a roundish, rather ill-defined subapical cloud.

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* Ann. & Mag. Nat. Hist. (6) xviii. p. 248 (1896).

San Antonio, W. Colombia, 5800 feet, November 1907 (*M. G. Palmer*); one ♀.

A more glossy, less rough-scaled insect than its congeners.

Melanolophia accurata, sp. n.

♂. 44 mm.—Head and body concolorous with wings, face and occiput slightly brighter brown. Shape of wings nearly as in the group of *commotaria*, Mssn., fore wing somewhat broader than in that species; brown, slightly tinged with olive, and with scattered blackish scales, especially near base and in distal area, on costa of fore wing, and at inner margin of hind wing; the lines ferruginous, shaded with ochreous; fore wing with antemedian from one-seventh costa, very oblique outwards to cell, and somewhat darkened; then nearly vertical, incurved on M and indented on SM^2; median at before two-fifths, almost obsolete; postmedian from two-thirds costa, parallel with termen throughout, minutely toothed on veins, the teeth accompanied by dark dots; subterminal from five-sixths costa, nearly parallel with termen, indicated by a series of black dots between the veins, margined distally by small, somewhat lunulate whitish marks; the dots anterior to R^1 moderate-sized, those between radials large, the posterior ones minute and indistinct, grey rather than black; discal dot small, black, distinct; terminal dots small, black, distinct, especially anteriorly; fringe concolorous with wing. Hind wing with no antemedian line, postmedian straight, from inner margin at two-thirds to the fold between C and SC at nearly three-fourths, here weakly angled, but becoming almost entirely obsolete; subterminal spots all small; terminal dots minute and for the most part indistinct. Underside nearly unicolorous grey-brown, weakly dusted and strigulated with blackish, the costa of fore wing somewhat olivaceous; the faintest possible suggestion of a subterminal band of a similar tone; cell-spots and terminal dots nearly as above.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♂.

Probably akin to *muscitincta*, Warr. Nov. Zool. xii. p. 354. Warren calls the whole of this group by the untenable name of *Cymatophora* (Hüb. Tentamen, ined.?, Packard; nec Treitschke). The group contains *canadaria*, Guen., the type of *Melanolophia*, Hulst. In the present species SC^{1-2} of fore wing are stalked as usual, but SC^1 anastomoses with C.

Melanolophia digna, sp. n.

♂. 42–43 mm.—Face pale ochreous, with triangular dark marks at sides and above; palpus pale ochreous at tip and on the inner side, fuscous beneath and exteriorly; antennal shaft fuscous, ringed with pale ochreous; legs pale ochreous, fore and middle pairs irregularly banded with fuscous, hind sparingly spotted with fuscous; vertex, thorax, and abdomen concolorous with wings. Wings shaped as in the preceding species, termen of fore wing perhaps slightly more elbowed at R^3; lavender-grey, speckled with black and very sparsely with tawny, the veins very pale yellowish; lines very ill-defined, indicated by an increase of the tawny and black scales, slightly mixed with ferruginous, commencing from dark marks on costa; antemedian at one-fifth, outbent in cell and on submedian fold; median well before one-half, obsolescent, but sometimes with a distinct black spot on M at the base of M^2; postmedian from costa at two-thirds, forming an indentation between R^1 and R^3 and again above and below SM^2, these indentations being filled up with black spots; minute black dots on the veins; subterminal at five-sixths, indistinctly pale, preceded from costa to R^1 and from inner margin to submedian fold by some small black spots, and preceded and followed on either side of R^3 by strong black marks, the distal the larger; termen with small black dots between the veins; fringe concolorous with wing. Hind wing with the black dusting rather strong basally; antemedian line from inner margin at two-fifths, mixed with dark grey; postmedian at before two-thirds, slightly lunulate-dentate, bending towards tornus from submedian fold; accompanied by some dark marks towards inner margin; subterminal indicated by a series of small black dots, followed by pale scales; its course parallel to termen until near inner margin, where it bends towards tornus; terminal dots as in fore wing. Both wings with very small black cell-spot. Underside more brownish grey, dark-dusted, fore wing with the costa spotted with dark, a vague dark narrow submarginal band, most distinct on anterior half, followed at apex by an ill-defined whitish spot; hind wing similar, the apex not whitened; both wings with the cell spot.

Torné, Colombia, August 1907; four ♂♂.

Notwithstanding its similarity in markings to several other species of the group (*commotaria*, &c.), its delicate coloration gives this species a rather distinctive appearance.

The venation varies slightly, SC^1 of fore wing anastomosing with C in one only of the four.

Odysia punctilineata (Warr.), ab. (?) *extensata*, nov.

♀. 41 mm.—Face dark fuscous, narrowly wood-brown at base of antennæ; palpus and fore leg dark fuscous, the femur and tibia pale on outer side; head and thorax wood-brown, with fuscous speckling; abdomen dorsally fuscous, with anal segments paler. Wings elongate. Fore wing wood-brown, darkened with numerous fine fuscous speckles and suffused with dull blackish before the outer line, the suffusion extending basewards along submedian fold and outwards beyond cell; lines all very obscure and marked mainly by black pale-tipped dashes on veins and submedian fold; the inner line double, oblique outwards and angled in cell, then oblique inwards; second line curved from costa before middle, outer from three-fourths, approximated to second line on inner margin; subterminal marked by dark pale-tipped lunules; black marginal spots between the veins; beyond them the paler fringe is chequered with dark. Hind wing with the median space darker, especially along the outer line; all the lines blacker and plainer; the marginal spot between R^1 and R^3 distinctly double, as in several species of the group. Underside uniform dull smoky fuscous, the fringes pale.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♀.

I have described this form fully and independently on account of its different aspect, but I believe it will prove to be a much darkened aberration (perhaps even the normal ♀ form) of *Odysia* (?) *punctilineata*, Warr. Nov. Zool. vii. p. 198 (*Stenalcidia*), of which I possess the ♂ from the same locality. In the paucity of generic characters in the large group (*Boarmia*, sens. lat.) to which this species belongs, it may be referred to *Odysia*, Guen., =*Isandria*, Warr., to the type species of which (*O. molaria*, Guen., =*ineffectaria*, Walk.) it is evidently related. The antennal pectinations (♀) reach a length of about 2½ (in terms of the width of shaft) and each is surmounted by a single bristle; in *molaria* each bears at its extremity a pair of short, slender, divergent bristles; in the apical third the antenna becomes merely serrate and with the bristles, and at the extremity nearly simple. The termen of hind wing is less strongly dentate than in *molaria*. In venation and general aspect *Odysia* agrees with *Stenalcidia*.

Odysia accessilinea, sp. n.

♀, 38 mm.—Face dark reddish brown; palpus dark fuscous, lighter at the tip; fore leg fuscous above; head, body, and upper surface of wings light brown, densely irrorated with darker, redder brown, this colour forming a rather conspicuous shade or band distally to the postmedian line in both wings; the lines black. Fore wing elongate; some dark costal markings near base; first line from costa at one-fourth, strongly oblique outwards to cell-fold, thence strongly oblique inwards to inner margin close to base; consisting merely of spots on costa, SC, and cell-fold, a dash on M at the base of M^2, and a very oblique, slightly waved line from submedian fold to inner margin; cell-spot minute; postmedian line weak, but rendered conspicuous by black dashes on the veins, from costa at two-thirds, parallel with termen to middle of wing, then incurved to submedian fold, where it closely approaches the antemedian, outangled on SM^2 and reaching the inner margin at scarcely beyond two-fifths; subterminal line whitish, strongly fuscous shaded on both sides and with the teeth accentuated distally by black dots; preceded by a black dash between SC^4 and SC^5; terminal line waved, fine, black, swollen into spots between the veins; fringe partly clouded with fuscous. Hind wing rather narrow, termen dentate, not strongly convex; a thick basal line in continuation of the antemedian of fore wing; a nearly straight antemedian from SC to inner margin; a rather small but distinct cell-spot; a somewhat waved postmedian parallel with and about 4 mm. removed from termen; subterminal line less sharply dentate than in fore wing. Underside dark fuscous, the fringe paler; hind wing with paler irroration, the black cell-spot distinctly visible.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♀.

Antennal pectinations quite as in *O. punctilineata*, ab. *extensata*, to which, in shape and in the darkened underside, the present species makes a rather close approach. The form and position of the lines, however, and especially the somewhat more strongly dentate termen of the hind wing, point to its specific distinctness. It is not impossible that it, too, may eventually prove to be the female to some known "*Stenalcidia.*" The group containing *dimidiaria*, Guen., *quisquiliaria*, Guen., *elongaria*, Snell., and others is a difficult one, but I have given very careful attention to it without discovering any species to which *accessilinea* could possibly be referred. The females of several are already known and have simple antennæ.

NOTE.—I have two ♂ ♂ which probably belong to this species; the above description would apply to them, with the following differences:—33–34; somewhat lighter, more sharply marked; fore wing with a curved dark shade preceding the antemedian, meeting it on inner margin; a fine, slightly interrupted, dark median line, strongly outcurved behind cell-spot, then nearly parallel with postmedian; postmedian less sharply inbent on submedian fold, therefore less closely approaching antemedian; hind wing with discal spot nearer to antemedian than to postmedian, whereas in the type ♀ the reverse is the case; underside much paler, that of the fore wing lighter fuscous, with inner margin whitish and cell-spot distinct, that of the hind wing whitish, with costa slightly infuscated and cell-spot distinct; antennal pectinations rather long.

Oconeque, S.E. Peru, 7000 feet, July 1904 (*G. Ockenden*); Torné, Colombia, August 1907; also in coll. Dognin from San Antonio.

Perhaps nearest to the more sharply marked examples of *Stenalcidia elongaria* (Snell.), but readily distinguished by having the postmedian line of the hind wing further from the termen.

Stenalcidia præparata, sp. n.

♂. 32 mm.—Face fuscous above, whitish below; palpus fuscous; antennal shaft banded whitish and fuscous; vertex and occiput white; thorax and abdomen white, marked with fuscous. Hind tibia much dilated, the hair-pencil strongly developed. Wings white, sparsely strigulated with brown and fuscous. Fore wing with costa dark fuscous nearly to antemedian line, more broadly at base; large dark fuscous costal spots at the origin of the three lines, a larger blotch proximally to the subterminal, a narrow costal darkening at apex, and strong costal strigulation in the interspaces; costal spot at origin of antemedian line oblique outwards, reaching into cell, the line here sharply angled, becoming very oblique inwards to inner margin near base, thickened on M and inangled on submedian fold; median shade brown, extremely indistinct; cell-spot diffuse, not very intense; postmedian line distinct, strengthened by black dashes on the veins, from costa just before two-thirds, deeply incurved in posterior half of wing, nearer to base than to termen on submedian fold, reaching termen at middle; an indistinct brown shade distally to the postmedian; subterminal line white, thick, zigzag, crossed by clear white longitudinal shades above and below the radials, and crossing a dark fuscous blotch between the radials (R^1 to R^3); terminal dots large, black; fringe white, chequered with brown at the vein-ends. Hind wing similar, the inner line becoming a large dark basal spot, the median shade a somewhat irregular, diffuse, antemedian, cell-spot rather darker and more sharply defined than in fore wing, inclining to a broadly crescentic form. Underside whitish, the fore wing slightly grey-clouded in disk, weakly grey-marked on costa and with a moderately broad fuscous marginal band which encloses small pale patches on the margin itself from apex to R^1, from R^3 to M^1, and from M^2 to tornus; hind wing with narrow subapical dark band to R^1; both wings with dark discal and terminal spots.

Pozuzo, Peru, 800 m.

Differs from *biniola*, Dogn. Ann. Soc. Ent. Belg. xliv. p. 224, in the brighter colouring, smaller discal spots, and other details.

Stenalcidia subannulata, sp. n.

♂. 34 mm.—Face dark reddish brown, narrowly pale below; palpus fuscous; antennal shaft pale; vertex and occiput white marked with brown; collar brown; shoulder white, tipped with brown; thorax and abdomen otherwise concolorous with wings. Wings white, strongly shaded with brown and dusted with fuscous; median area of fore wing (especially towards costa) and base and median area of hind wing somewhat whiter. Fore wing with the lines arising from three equidistant black spots on costa; antemedian from before one-third, lunulate-dentate, the teeth thickened with black on the veins and folds, oblique inwards from submedian fold to inner margin; median shade distinct, crossing the cell-spot; cell-spot rather large, somewhat lunular, pale, with black circumscription; postmedian line from costa at about two-thirds, grey, marked with short black dashes on the veins; oblique outwards to R^3, then oblique inwards to submedian fold, again outbent almost at a right angle, vertical below SM², and reaching inner margin at two-thirds; subterminal line pale, dentate, filled in with fuscous spots proximally; terminal dots rather large, black. Hind wing similar, without first line; median shade fuscous brown, rather diffuse, placed proximally to the cell-spot, marked with black dashes on SC and M; postmedian less strongly ang'ed on submedian fold. Underside pale; fore wing with costa dark-spotted and with a dark marginal band, gradually narrowing from costa to inner margin, and leaving the apex (to R¹) very narrowly pale; hind wing with faint traces of dark marginal shade at apex only; both wings with rounded grey discal spot, less clear than above and scarcely pale centred.

Sapucay, 5th November, 1904 (*W. Foster*); one ♂.

Stenalcidia rotunda, sp. n.

♂. 28–30 mm.—Head, with face and palpus, thorax, legs, and abdomen concolorous with wings; face narrowly pale below. Antennal pectinations moderate. Fore wing with costa arched, apex somewhat rounded, termen roundly convex, not very oblique; whitish, thickly irrorated with dark brown and fuscous; costa dark-spotted, more broadly at base; lines fuscous, starting from thick blackish marks on costa; antemedian thick, somewhat interrupted, strongly bent back in middle of cell, reaching inner margin just outside the fovea, which is strongly developed and dark-margined; median shade very strongly curved round the cell-spot, indistinct in lower half of wing; cell-spot rounded, moderately large, black; postmedian line only distinct through dark dashes on the veins, from two-thirds costa, oblique outwards to R¹, parallel with termen to R³, strongly oblique inwards to submedian fold, there strongly angled, more weakly angled on SM², reaching inner margin at slightly beyond one-half; subterminal line whitish, dentate, filled in with fuscous and with black dashes between the veins; terminal spots black, connected with black dashes running inwards towards the subterminal; fringe concolorous with wing, slightly mottled. Hind wing with a straight diffuse antemedian shade; cell-spot, postmedian (at little beyond one-half), subterminal and terminal as in fore wing. Underside much paler, the fore wing pale greyish, slightly darker distally, the costa dark spotted; hind wing nearly white, very weakly dusted; both wings with large cell-spot and small terminal spots between the veins.

Sapucay (*W. Foster*) in Coll. L. B. Prout, one ♂ (type); and Coll. Brit. Mus., one ♂, 4th October, 1903.

Differs from normal *Stenalcidia* in the more rounded fore wing. Agrees in venation (SC^{1-2} of fore wing coincident, R^2 central) and other points of structure.

Iridopsis albescens, sp. n.

♀. 41 mm.—Head, body, and wings whitish, the wings sparsely dusted with brown, smoothly scaled, and with some iridescence; the lines slender, dark grey. Fore wing with first line from before one-third, commencing in a somewhat diffuse dark spot on costa, outangled in cell, then oblique inwards to inner margin at two-sevenths; median shade weak, from a diffuse dark spot in middle of costa, crossing the cell-spot, and becoming more distinct at inner margin; cell-spot reniform, clear white, somewhat raised, surrounded by some dark shading; postmedian line from just beyond two-thirds costa to about middle of inner margin, forming a sinus between R^3 and M^2, and another towards inner margin, rather strongly elbowed just below M^2; antemedian preceded and postmedian followed by weak ferruginous-brown shades; subterminal pale line indicated by dark shading on either side, strongest in anterior half of wing; a series of black terminal spots between the veins. Hind wing with rather distinct antemedian line from costa towards middle to inner margin at about two-fifths; an elongate, somewhat raised, clear white cell-mark, with fine dark circumscription; postmedian angled on radial fold (R^2), then incurved, touching the posterior margin of cell-spot, followed by weak, diffuse, ferruginous-brown line; subterminal line indicated by dark shading on either side. Fore wing beneath dirty white, with dark discal spot and dark submarginal band, which leaves the apex pure white, nearly touches the termen from R^1 to R^3, becomes narrow and separate from termen to M^2, and is scarcely traceable beyond; hind wing beneath dirty white, with indistinct dark apical spot.

"Venezuela," without more exact locality; one ♀.

Iridopsis nephotessares, sp. n.

♂. 45 mm.—Coloration and general aspect of *I. rupertata*, Feld.,=*salmonearia*, Ob., basal and median areas of fore wing very nearly as in that species, the median shade not appreciably double, ending in a conspicuous, strongly angled, dark mark on inner margin, which is not distinctly expressed in *rupertata*; postmedian line distinctive, strongly oblique inwards, and thickened from above R^2 to lower angle of cell, very shortly bent outwards along M^1, moderately straight and less distinct (except on veins) from M^1 to submedian fold, thence incurved nearly as in *rupertata*; some dark fuscous and red-brown clouding on and about R^3 on either side of the postmedian; apex scarcely paler than the subapical patch. Hind wing with antemedian scarcely double, the dark shade behind it being almost entirely obsolete; postmedian fine and ill-defined in costal half of wing, more distinct, and with thickened marks on the veins, in inner-marginal half, angled on radial fold (R^2) and bent inwards below, to lower angle of cell, as in fore wing. Underside of fore wing with the dark costal shading and discal spot and the normal subapical patch, sometimes with some weak dark submarginal shading from this patch to below M^1, and a weak curved line, darker-dotted on the veins, from the proximal edge of the patch parallel with termen to M^2, some dark postmedian clouding about R^3; underside of hind wing unmarked, or with a dark cell-spot.

Santo Domingo, Carabaya, S.E. Peru, 6000 feet; type. I have also seen one or two others from this locality. Oconeque, S.E. Peru, 7000 feet, July 1904; a fine ♂ in Coll. Brit. Mus.

Iridopsis w-notata, sp. n.

♂. 36–39 mm.; ♀. 40–44 mm.—Head (with face), thorax, and abdomen whitish, mixed with fuscous, palpus more strongly fuscous. Wings scarcely iridescent, whitish, dusted with coarse fuscous atoms, and in the ♂ more or less strongly shaded with tawny brown on the veins, about the margins (especially in the middle of inner margin of fore wing), and beyond the postmedian of fore wing subapically, but without the strong subapical patch of the *syrniaria* group. Fore wing with the antemedian line as in most of the genus, slender, grey, ill-defined, preceded by an ill-defined diffuse shade, grey in the ♀, more tawny in the ♂, both line and shade starting from dark spots on costa, and closely approximating posteriorly; median line usually obsolescent except for a dark spot on costa above the cell-spot and another just before middle of inner margin; cell-spot large, roundish, dark grey; postmedian line from a dark spot on costa at beyond two-thirds, forming a black **W** between SC^5 and R^2 (with its base pointing distad), terminating abruptly immediately below R^2 and scarcely discernible in a few dark scales beyond (which show that it follows nearly the same course as in *I. syrniaria*), and a blackish comma just beyond the middle of inner margin; subterminal pale line very indistinct, only rendered visible by some accumulation of the dark atoms, particularly between R¹ and R³; terminal line fine but continuous, blackish, lunulate-dentate, the teeth sometimes expanding into black spots between the veins; fringe concolorous with wing, slightly dark shaded at vein-ends and divided by a faint fuscous central line. Hind wing with dark marks on inner margin before one-half, representing the beginnings of nearly obsolete double antemedian line; an oval pale cell-spot with dark circumscription; a postmedian dark line, sharply angled outwards on the radial fold (R²), thence slightly incurved to near the cell-mark—in one specimen even touching it; a slight tawny brown shade accompanying the postmedian distally, especially in the ♂; the pale subterminal indicated by weak dark shading in the distal area; terminal line as in fore wing. Underside white, usually with only the same markings as in *syrniaria*, in the type (♀) also with narrow dark shading continued from the proximal part of the subapical blotch of the fore wing as far as M², a distinct dark cell-spot, and suggestions of a dark submarginal line in hind wing.

Cuença, Ecuador, 3 ♂♂, 2 ♀♀, April and May 1906 (*D. G. Hum*), kindly presented by Mr. F. B. Cross; the type (a ♀) dated May 1906.

Distinguished from all previously known species by the W-like angulations of the postmedian line of fore wing.

Acrotomodes casta, sp. n.

♂. 31–34 mm.—Face, palpus, and antenna rufous; vertex, thorax, and abdomen bluish white, the latter with a rufous band on the basal segments dorsally. Fore wing very pale bluish white, in basal and costal areas speckled and striated with rufous; lines rufous; inner line thick, at two-fifths, acutely angled outwards on SC, then oblique, slightly waved inwards; outer line from two-thirds costa, oblique outwards and thick to SC⁵, thence fine and slightly incurved to M², outcurved to SM², and vertical; a diffuse rufous patch at end of cell; subterminal line preceded by a triangular rufous blotch on costa and by rufous patches beyond outer line, mixed with black dots and a black spot on submedian fold; at anal angle also followed by a rufous cloud; fringe deep rufous. Hind wing with a rufous band at base, a median waved line, and large rufous diffused patch at apex; coarsely sprinkled with black scales; fringe rufous in apical half, bluish white below. Underside suffused with pale rufous and dotted with black; the fore wing terminally suffused with red-brown including the fringe, the inner margin white, the costal area yellowish, at apex bluish white.

Chanchamayo, Peru; three ♂ ♂.

Close to *A. leprosa*, Warr. Nov. Zool. xiv. p. 297, of which it may prove a local form. The three specimens do not vary except in size; they are much paler and more weakly marked than Warren's species, the outer line of fore wing less "crenulate," &c. Venation as in that species (SC^1 and SC^2 of fore wing both free).

Acrotomodes hemixantha, sp. n.

♂. 32 mm.—Head purplish, basal segment of palpus yellow; thorax and abdomen purplish above, yellow beneath; legs in part ochreous, fore and middle tibiæ and all tarsi dull purplish. Fore wing deep slaty purple, lines finely grey; antemedian outcurved from one-fourth of costa to submedian fold, thence approximately vertical, incurved between M and SM; externally edged with darker; postmedian from two-thirds costa shortly oblique outwards, angled on SC^5, then inwardly oblique to three-fifths inner margin, paler at costa and preceded by a dark line; upper end of cell and space beyond to angle of postmedian line dull olive, showing a blackish vertical linear cell-spot, veins SC^5 and R^1 along it dotted with dark; subterminal line invisible except at costa, where it is preceded by a dark triangular shade, the extreme apex bluish grey; fringe dark purplish. Hind wing concolorous, with a median dark, pale-edged line; costal area, especially at base, dull pinkish. Underside dull slaty purple, the base of fore wing, and the hind wing to beyond one-half, dull deep yellow.

Pozuzo, E. Peru, 800 m., October 1907; one ♂.

Of closely the shape and general aspect of *Acrotomodes*, and agreeing therewith in many points of structure, but the generic position somewhat uncertain. Apex of fore wing somewhat less acute, termen less oblique posteriorly and not at all gibbous at R^1; SC^{1-2} longish stalked, their stalk connected (by a backward-running bar) with C. In all the other *Acrotomodes* which I have been able to examine SC^1 is unconnected with C, though it varies in being either short, stalked with SC^2 (*sporadata*) or free (*leprosa* and *casta*).

Gynopteryx (?) *punctinotata*, sp. n.

♂. 38 mm.—Head, thorax, abdomen, and legs all yellow; hind tibia with a pencil of reddish hairs. Fore wing pale lemon-yellow, with a few red speckles; costa streaked and dotted with dull red-brown, especially in basal half; inner line shown by three red-brown dots in a slight curve, on SC, M, and SM^2, the first the largest; outer line from costa at nearly five-sixths, incurved in lower half, followed on costa by a triangular red-brown apical blotch, and on inner margin by an erect oval spot reaching submedian fold, the line itself marked by red-brown dots on the veins except R^2, each dot followed by some white scales; a small red-brown cell-dot; fringe yellow (damaged). Hind wing pale yellow, with red-brown cell-dot and postmedian curved row of vein-dots; a submarginal row (rather nearer to postmedian than to termen) showing through from beneath. Underside somewhat paler, with the markings fainter; dots of outer line of fore wing doubled; hind wing with submarginal curved row of red-brown dots.

Mexico, without more exact locality; one ♂.

I have been unable to find a genus with which this species agrees in its characters. The shape and coloration recall *Gynopteryx*, though it is a somewhat more slender-looking species; but its subcostal venation shows triple short anastomosis (SC^1 with C, SC^2—arising from cell—with SC^1 and again with SC^{3-4}); the discocellulars are incurved; C of the hind wing is closely approximated to SC to one-half of cell; the hairs of the face are abraded, but the face itself is not protuberant; the antennal pectinations are short and rather stout.

Gynopteryx gladiaria ustimacula, subsp. n.

♂. 29–37 mm.—Agrees with typical *G. gladiaria*, Guen., in structure and in ground-colour; subapical spot of fore wing always strongly developed, usually larger than in typical *gladiaria*; antemedian line grey, usually well expressed, sometimes thick, sometimes terminating in a round, scorched-coloured spot on inner margin; postmedian somewhat incurved, therefore further from termen, in its lower part, than in any but very rare aberrations of *gladiaria*; *ending in a large burnt-coloured spot on inner margin*; submarginal spots usually developed, though not as deeply as in the ab. *seriaria*, sometimes connected into a zigzag line. Hind wing with median line and submarginal spots or line well expressed. Underside with the markings well expressed, usually redder-tinted than in the other forms, the postmedian curved, as above.

Chanchamayo (type and others) and Pozuzo, E. Peru, a short series; numerous others seen.

With so variable a species as *G. gladiaria* this form would scarcely have merited a separate name, but that it forms a a definite race in E. Peru. The characteristic spot on inner margin at end of postmedian is much larger than in even strongly marked *seriaria* forms; while the rest of the spots, which equal the inner-marginal one in size in *seriaria*, are obsolete or extremely faint. I should have supposed *ustimacula* to be a species, but that I have one specimen from Peru with the spot weak, and one with it absent (*i. e.* approaching typical *gladiaria*), while, on the other hand, one *seriaria* from Sapucay, Paraguay, apparently taken among other *gladiaria* forms, is certainly referable to *ustimacula*, and another is intermediate towards *seriaria*, having the large spot of *ustimacula* with additional small spots on the line. I therefore consider that we have here an example of the "var." of one locality (in Staudinger's terminology) tending to become the "ab." of another.

Anisoperas pectinata, sp. n.

♂. 36–38 mm.—Head, thorax, and abdomen concolorous with wings. Fore wing grey-brown, densely striated with fuscous; costa, especially towards the apex, paler; inner and outer lines fuscous, conversely edged with leaden grey; the inner bent on SC, then vertical; the outer bisinuate, outwardly dentate on veins, with a small white spot beyond it below SC; a cloudy black cell-spot; the inner third of central fascia and a sinuous band of the same width beyond it paler, greyer; subterminal line dentate, indistinct, finely marked with grey scales. Hind wing without inner line; outer and subterminal lines more plainly dentate, the teeth more conspicuously followed by pale dashes on the veins; a pale grey band between the lines. Underside paler, with outer and subterminal lines marked.

El Congo, Colombia, June 1907 (type); Torné, Colombia, July to August 1907; three ♂ ♂.

The insect is almost an exact replica of *A. atropunctaria* (Walk.)*, except that the antenna of the ♂ is bipectinate; slightly more crenulate wing-margins and more dentate outer line of hind wing may perhaps also be taken as distinctive. *Tetragonodes rufata*, Dogn. Ann. Soc. Ent. Belg. xliv. p. 231, is probably a related species, but M. Dognin, to whom I have shown my *pectinata*, says it has different colour and scaling, the postmedian line of the hind wing more in the middle, &c. *Anisoperas jodea*, Druce, Biol. Centr.-Amer., Lep. Het. ii. p. 532, t. 98. f. 17, is another pectinated species of the genus.

Dasystole colopholeuca, sp. n.

♂. 40 mm.—Head, thorax, and abdomen coffee-brown, palpus more ochreous brown internally, externally blackish. Fore wing coffee-brown dusted with blackish; lines greenish grey, white at costa; antemedian oblique outwards from costa, shortly angled in cell, excurved between M and SM^2 and between SM^2 and inner margin, dentate inwards on veins; postmedian slightly oblique outwards to SC^4, nearly vertical to R^3, oblique inwards to M^2, then again nearly vertical—slightly outbent near inner margin; above R^3 marked by white dots on veins; subterminal line lunulate-dentate, whitish, very indistinct, except from costa to R^1, where it is followed by a grey-white apical patch; marginal dots between the veins greenish grey with black scales round them; cell-mark oval, black-edged, with centre of slightly raised greenish-grey scales; in anterior part of wing a dark curved median shade midway between cell-spot and postmedian; fringe brown. Hind wing paler brown along inner and distal margins, costal half dull whitish; a large round black cell-spot, followed by a sinuous greenish-grey postmedian line from R^3, curved and ending in a black, white-edged spot on inner margin near tornus; marginal dots as in fore wing; fringe brown. Underside of fore wing shining whitish in inner-marginal half, brown thickly black-dotted in costal; cell-mark nearly as above; edge of postmedian line on costa and apical patch whitish; underside of hind wing whitish, thickly black-speckled, tinged with brown in costal half; a large round black cell-spot and black dotted postmedian line, the latter blotched with black towards inner margin.

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* *Azelina atropunctaria*, Walk. List Lep. Ins. xxvi. p. 1517.

Torné, Colombia, July 1907; one ♂.

Meticulodes ambusta, sp. n.

♂. 49 mm.—Face, palpus, and antenna ferruginous brown; thorax and basal segments of abdomen blackish, dotted with black scales; abdomen grey-brown, brighter beneath. Fore wing with basal area ferruginous red-brown coarsely speckled with black, vein M and part of cell above it yellow, the other veins also more or less yellow; median area blurred purplish brown without the speckling; terminal area above M^1 dark iron-grey, below it brownish ferruginous; antemedian line black and thick, very oblique from costa, bluntly rounded above M, and oblique inwards to one-third of inner margin, interrupted below SC, followed in cell by a dull ferruginous patch, bounded by a dull blackish smear on DC; the costal part of median area and the space immediately following antemedian line suffused with deeper purple; postmedian black and fine, somewhat thicker from M^1 to inner margin, starting from a minute pale spot at six-sevenths of costa, obliquely curved inwards to two-thirds of inner margin, with a slight outward bend above SM^2; the iron-grey terminal area with a pale smear beyond postmedian line between R^2 and M^1; the lower ferruginous space thickly striated with black, with an ill-defined subterminal line edged with paler ferruginous; fringe ferruginous above R^1 and below M^1, blackish grey between, cut by ferruginous at the vein-ends. Hind wing dingy luteous grey speckled with dull black as far as the black, yellow-edged postmedian line; terminal area below M^1 bright ferruginous with black striation, above M^1 blurred grey with a purple tinge; inner margin below SM^2 bright ferruginous with black strigæ; fringe ferruginous. Underside of fore wing dull dark grey above M, dull white below; the veins brown; costal streak ochreous striated with grey-brown; a diffuse black blotch at middle of termen, and two subterminal dots above it; hind wing dull ferruginous brown, brighter ferruginous beyond the black postmedian line; inner margin yellow ochreous; the whole covered with black striations, except near costa.

Tornó, Colombia, August 1907; one ♂.

A very richly coloured species, evidently a rather near relative of M. *periculosaria*, Ob. Ét. Ent. vii. p. 27 (*Azelina*), of which I have a typical series from Torné. It is distinguished, apart from the rich coloration, by the *blackish* front of thorax, dark (not white) discal mark of fore wing, more regular postmedian line of hind wing, &c.

Nephodia xanthostigma, sp. n.

♀. 40 mm.—Antenna bipectinate, with moderate, rather slender branches. Otherwise very similar to *betala*, Druce *, but differing in having the face and vertex clearer yellow (concolorous with the submarginal spot), and in being somewhat darker, the lines of the fore wing less distinct, closer together—first line from costa at 7 mm. to inner margin at 6 mm., second from costa at 12 mm. to inner margin at 10 mm., somewhat incurved at middle; the line of hind wing still more indistinct, and much nearer base than in *betala*—crossing the middle of the wing, hence cutting the lower arm of cell, whereas in *betala* it is considerably posterior to the cell. The characteristic yellow spot quite agrees with Druce's species.

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* *Therina betala*, Druce, Biol. Centr.-Amer., Lep. Het. ii. p. 50, tab. xlv. f. 27 = *Nipteria luteopunctata*, Th.-Mieg, Le Nat. xxix. p. 225 (nov. syn.).

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♀.

Druce's *betala* belongs to the *Nipteria* section, the ♀ antenna being non-pectinate.

Nephodia (*Nipteria*) *consequens*, sp. n.

♀. 43 mm.—Face and palpus luteous; head, body, and wings uniform pale brownish grey, the wings thickly irrorated with slightly darker scales, somewhat less glossy than in most of the genus; the lines fine, darker brownish grey. Fore wing with antemedian from SC at one-third, slightly outcurved in cell, then straight from base of M^2 to inner margin, barely traceable between costa and SC; postmedian from costa at nearly three-fourths, gently outcurved beyond cell, nearly parallel with termen from R^3 to inner margin; a slightly elongate cell-spot concolorous with the lines; no dark terminal line; fringe concolorous. Hind wing slightly less irrorated, especially in basal part, a curved postmedian line from just before SC^2 at two-thirds (of wing) to inner margin at five-sevenths. Underside slightly paler than upper, the lines of fore wing faintly showing through.

Antenna nearly simple, agreeing with the ♀ antennæ of the rest of the *Nipteria* section, so far as known to me.

Santo Domingo, Carabaya, S.E. Peru, 6000 feet; one ♀. I have seen a second from the same locality.

Much paler than *N. tiza*, Dogn. Ann. Soc. Ent. Belg. xlii. p. 348,=*turpis*, Warr. Nov. Zool. xi. p. 104 (nov. syn.); also paler than *ellopiata*, Dogn. loc. cit. xlvi. p. 346, of which it reminds in texture and scaling, but which has the postmedian line different, the underside much darker, &c.

Nephodia (*Nipteria*) *falculata*, sp. n.

♀. 43 mm.—Fore wing with apex bluntly falcate, the termen having a shallow rounded excision below it. Head, thorax, abdomen, and upper surface of wings uniform glossy brownish grey, as in the *N. incoloraria* (Guen.) group. Under surface darker and redder, dusted with fuscous, the fore wing with an indistinct darker marginal cloud from about SC^5 to tornus, narrowing off to a point at tornal end; inner marginal half of fore wing otherwise slightly paler than costal; both wings with minute dark cell-spot, and faint dark postmedian line, strongly dark dotted on the veins; that of fore wing from costa at 4 mm. before apex, very slightly oblique inwards; that of hind wing also at about 4 mm. from termen, nearly parallel therewith, but slightly less strongly curved and consequently a little further from termen in middle.

San Antonio, W. Colombia, 5800 feet, December 1907 (*M. G. Palmer*); one ♀.

Distinguished by the falcate fore wing. Belongs to the *Nipteria* section, the antenna being rather shortly but thickly ciliated.

Astyochia emphanes, sp. n.

♂. 25–27 mm.—Head (with face, palpus, and antenna), body, and legs brown-black; tongue bright yellow. Wings proximally white, semitransparent, distally glossy brown-black. Fore wing with costa to SC of same colour, and with the distal border commencing at scarcely beyond two-fifths (well before end of cell), its proximal edge usually with a slight projection inwards on M, but running nearly straight in the direction of tornus to submedian fold, thence sharply bent back to inner margin at two-thirds; a few dark scales in basal part of cell; an oblique oval subapical white spot from before R^1 to beyond R^2, somewhat variable in size and shape. Hind wing with costa very narrowly blackish; the dark distal border from before two-thirds costa to about one-half inner margin, continuing extremely narrowly along inner margin to base; its proximal edge vertical to SC^2, then strongly bent back towards termen, rounded on R^3 at about 2 mm. from termen, thence nearly parallel with termen. Underside the same.

La Oroya, Rio Inambari, S.E. Peru, 3100 feet, January 1906 (type); also a long series of ♂ ♂ from the same locality, September and November to January in Coll. L. B. Prout, Coll. Brit. Mus., &c.

I am told that this species has been confounded with *A. dolens*, Druce, Ann. Mag. Nat. Hist. (7) iii. p. 301, = *negrita*, Warr. Nov. Zool. vii. p. 187, from Bolivia, which is a much darker and duller insect.

Devarodes (?) *subfenestrata*, sp. n.

♂. 29 mm.—Face and cheeks white, vertex, palpus, and antenna black, the latter with very short stout pectinations, little longer than the width of shaft; thorax varied black and white above, white beneath; abdomen dorsally black, white-ringed, ventrally white. Fore wing black, with a large white inner-marginal blotch reaching, on the margin, from the fovea to about two-thirds, its upper (anterior) margin rounded, reaching to the cell-fold. Hind wing with inner half white, outer black, the boundary of the two colours gently curved, nearly parallel with termen; veins partly blackened, especially towards base. Underside of fore wing with white blotch as above, in addition with a white streak between C and SC from base to about one-third and a small elongate white subapical blotch; of hind wing with the dark border reduced to a narrow median bar and diffuse streaks from this to the termen on R^1, R^3, M^1, M^2 and from SM^2 to inner margin, the interspaces remaining white; the dark lines on SM^2 and at base of C and of M thicker than above.

Huancabamba, Cerro del Pasco, E. Peru; one ♂.

Shape and general aspect agree with such species as *charisea*, Druce, &c.; but SC^{1-2} are stalked instead of anastomosing, their stalk connected by an extremely short bar with C, and in the hind wing the discocellulars are strongly oblique and SC^2 is very short stalked with R^1. In the group mentioned, so far as I have tested it, the ♂ antenna is very much more strongly bipectinate, SC^1 anastomoses (often quite strongly) with C, and SC^2 arises separately—either from cell or from base of stalk of SC^{3-5}—anastomosing with SC^1; but variation in some of these details will almost certainly be found.

LX. — *Additions to the non-Marine Molluscan Fauna of British and German East Africa and Lake Albert Edward.*

By H. B. Preston, F.Z.S.

[Plates VII.-IX.]

Gibbulina expatriata, sp. n. (Fig. 1.)

Shell small, cylindrical, with very blunt apex, scarcely rimate, whitish; whorls 7, flat, sculptured with fine, closely set, transverse, arcuate striæ; sutures very lightly impressed, slightly crenellate below by the terminations of the transverse striæ; columella rather broadly expanded, descending nearly vertically, and extending into a broad, thick, white, well-defined callus, which joins the lip above; labrum white, thickened, reflexed, somewhat sinuous above; aperture rectangular; interior of shell glossy, showing the transverse sculpture through the shell.

Alt. 9, diam. maj. 3 mm.

Aperture: alt. 2, diam. 1·5 mm.

Hab. Shimbi Hills, British East Africa.

Ennea quadrilateralis, sp. n. (Fig. 2.)

Shell rather large, rectangularly ovate, perforate, somewhat thin, pale yellowish; whorls 6, sculptured with moderately fine, very closely set, arcuate, transverse striæ; sutures impressed, crenellated below by the termination of the transverse striæ; umbilicus narrow, partly concealed by the reflection of the columella; columella white, descending in a gentle curve and extending upwards and outwards into a thin callus, which reaches the lip above; labrum white, reflexed and terminating in a sinus, which forms with the parietal wall a triangular notch; aperture almost square, edentulate; interior of shell white.

Alt. 20·5, diam. maj. 17·5 mm.
Aperture: alt. 10, diam. 9·5 mm.
Hab. Shimbi Hills, British East Africa.

Ennea gwendolinæ, sp. n. (Fig. 3.)

Shell scarcely rimate, cylindrical, yellowish white, smooth, polished; whorls 6½, moderately convex; sutures impressed, narrowly margined above; columella extending above into a thin, white, well-defined callus; labrum white, sinuous above, rather broadly expanded, thickened, and reflexed; aperture irregularly subrectangular, bearing a slightly curved or twisted parietal lamella on the right, a large, broadly bifid lamella on the outer lip, and a small denticle inside the basal lip, while the columella is internally developed into a broad shelf-like projection, ending in a thick, oblique, C-shaped lamella at its base.

Alt. 5, diam. maj. 1·5 mm.
Aperture: alt. 1, diam. ·5 mm.
Hab. Shimbi Hills, British East Africa.

Separable from *E. subflavescens*, Smith, from Mamboia, German East Africa, by its much narrower and smaller form; it lacks the small upper lamella on the outer lip, the upper basal denticle, and has only the oblique C-shaped lamella on the columella, instead of the three columellar lamellæ of that species.

Ennea marionæ, sp. n. (Fig. 4.)

Shell pupiform, transparent, vitreous, white, smooth, polished; whorls 6, the last finely puckered behind the labrum; sutures impressed, narrowly margined above; columella broadened above, narrowing obliquely below; labrum sinuous, opaque, white, rather broadly expanded, and reflexed; aperture irregularly rectangular, bearing a rather coarse, slightly curved, parietal lamella, a thick triangular denticle on the outer lip, a short but well-developed lamella immediately opposite on the columella, and below this a small denticle at its base.

Alt. 4, diam. maj. 1·75 mm.

Hab. Shimbi Hills, British East Africa.

Ennea jod, sp. n. (Fig. 5.)

Shell minute, cylindrical, whitish, transparent, polished, smooth; whorls 5½, flat; sutures incised, narrowly margined below; labrum white, not reflexed; aperture semielliptical, armed with a rather erect parietal lamella, a large lamella on the upper part of the labrum, below which occur four small denticles, of which the first, or that next to the large upper lamella, is the smallest; the columella is also broadened out into a shelf-like projection.

Alt. 2, diam. maj. ·75 mm.

Hab. Shimbi Hills, British East Africa.

Ennea sperabile, sp. n. (Fig. 6.)

Shell pupiform, rimate, white, smooth; whorls 7, flat, the last bearing a single strangulation, and transversely puckered into five creases behind the aperture; sutures impressed; columella descending somewhat obliquely, outwardly expanded, broadening inwardly into a lamella or fold, and extending above into a thick well-defined parietal callus; labrum broadly reflexed, especially at the base; aperture irregularly subquadrate, armed with an oblique parietal lamella on the right side, a coarse lamella on the outer lip, and a small basal denticle internally situate on the left.

Alt. 5·25, diam. maj. 2·25 mm.

Aperture: alt. 1, diam. ·75 mm.

Hab. Shimbi Hills, British East Africa.

Somewhat resembling *E. varians*, Smith, from Chiradzula Mountain, but without the obtuse spire, transverse sculpture, and small basal denticle of that species.

Ennea delicatula, sp. n. (Fig. 7.)

Shell minute, ovately cylindrical, glossy, shining, whitish; whorls 6¼, bluntly increasing to the fourth, and then again decreasing, sculptured with rather coarse, moderately distant, transverse costulæ; sutures impressed; columella descending in a slight curve; labrum white, polished, rather broadly reflexed; aperture somewhat ovately rectangular, bearing a rather large, coarse, shortly curved parietal lamella on the right side, a very broad and coarse lamella on the outer lip, and a very small nodulous denticle at the base of the columella, the last somewhat deeply situate within

Alt. 3, diam. maj. 1·5 mm.

Hab. Shimbi Hills, British East Africa.

Ennea radius, sp. n. (Fig. 8.)

Shell rimate, ovate, with somemhat acuminate apex, yellowish white, moderately solid; whorls 7, the first six rapidly increasing, the last decreasing, sculptured with somewhat distant, arcuate, transverse costulæ, which become smaller, more numerous, and closely set just behind the labrum, the last whorl strangulate; sutures impressed; umbilicus narrow, deep; columellar lip erect, exserted, extending into a broad parietal callus; labrum white, expanded, slightly reflexed; aperture subrectangular, bearing a single, erect, parietal lamella, a broad and coarse binodulate projection on the outer lip, and a small but broad denticle on the columella.

Alt. 3·25, diam. maj. 2 mm.

Hab. Shimbi Hills, British East Africa.

Closely allied to *E. minuscula*, Morl.*, from the island of Anjouan, but rather more coarsely sculptured than that species, which also lacks the denticle on the columella; moreover, the projection on the outer lip of *E. minuscula* is much smaller and not binodulate.

Martensia gwendolinæ, sp. n. (Fig. 9.)

Shell differing from *M. jenynsi*, Pfr., its nearest ally, in its more inflated whorls, more convex base, and in the spiral sculpture, which is much finer in the present species.

Alt. 9·25, diam. maj. 12, diam. min. 10·75 mm.

Aperture: alt. 5·5, diam. 5 mm.

Hab. Usagara, German East Africa.

Martensia martensiana, sp. n. (Fig. 10.)

Shell perforate, turbinately discoidal, white above, variegated on the base with greyish streaks and blotches, painted on the last whorl with a reddish-chestnut peripheral band; whorls 6, regularly increasing, the fifth somewhat convex, the last bluntly carinate at the periphery, sculptured with very fine, closely set, transverse, oblique striæ; sutures impressed;

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* Journ. de Conch. 1877, p. 340, pl. xii. fig. 5.

base of shell very indistinctly spirally striate; perforation very narrow; columella triangularly outwardly expanded, descending very obliquely; labrum simple; aperture broadly and obliquely lunate.

Alt. 11, diam. maj. 16, diam. min. 14 mm.

Aperture: alt. 6, diam. 7 mm.

Hab. Shimbi Hills, British East Africa.

Allied to *M. pyramidea*, v. Mart., but with more exserted spire, narrower and higher aperture, and finer transverse sculpture than has that species.

Martensia monozonata, sp. n. (Fig. 11.)

Shell perforate, turbinately depressedly discoidal, thin, pale yellowish flesh-colour, painted with a super-sutural band of reddish purple, which appears as a super-peripheral band on the last whorl, ornamented below the periphery with radiate interrupted streaks of cream-colour; whorls 5½, the last carinate at the periphery, sculptured with very fine, closely set, silky striæ; base of shell shining, very finely spirally striate; perforation very narrow; columella descending obliquely; labrum acute; aperture broadly sublunate.

Alt. 7, diam. maj. 12·25, diam. min. 10·5 mm.

Aperture: alt. 5, diam. 6 mm.

Hab. Shimbi Hills, British East Africa.

Martensia (?) *shimbiense*, sp. n. (Fig. 12.)

Shell broadly conoidal, thin, perforate, pale brown; whorls 5½, the earlier whorls finely spirally sculptured, the later sculptured with fine, very oblique, closely set, transverse striæ, the last whorl strongly carinate at the periphery; base of shell closely spirally striate; suture impressed, margined above with a narrow ridge-like formation; umbilicus moderately narrow, very deep, partly concealed by the expansion of the columella; columella obtusely angled; labrum acute; aperture broadly sublunate.

Alt. 7·5, diam. maj. 10·5, diam. min. 9·5 mm.

Aperture: alt. 4, diam. 4·25 mm.

Hab. Shimbi Hills, British East Africa.

Owing to the spirally sculptured apical whorls I am in much doubt whether this species should rightly be placed in the section *Martensia*.

Thapsia exasperata, sp. n. (Fig. 13.)

Shell depressed, suborbicular, rimate, thin, horny, polished, fulvous; whorls 4, marked with lines of growth; sutures impressed, faintly margined below; perforation very small; columella slightly curved and reflexed; labrum simple, arcuate; aperture sublunate.

Alt. 3·5, diam. maj. 7, diam. min. 6 mm.

Aperture: alt. 3, diam. 3·75 mm.

Hab. Shimbi Hills, British East Africa.

Thapsia insulsa, sp. n. (Fig. 14.)

Shell differing from *T. exasperata* in its much smaller size and more compact coiling, though having the same number of whorls, rather less depressed spire, and proportionately wider perforation, which in the present species, notwithstanding its much smaller dimensions, is of about the same diameter as *T. exasperata*.

Alt. 1·5, diam. maj. 3·25, diam. min. 2·75 mm.

Hab. Shimbi Hills, British East Africa.

Phortion ariel, sp. n. (Fig. 15.)

Shell small, globosely turbinate, thin, horny, pale brown; whorls 5, rather flat, sculptured with very fine and closely set, silky, transverse and minute, spiral striæ; sutures impressed; base of shell inflated; columella reflexed, vertically descending and forming an obtuse angle with the labrum which is acute and arcuate; aperture sublunate.

Alt. 4, diam. maj. 3·5 mm.

Aperture: alt. 1·75, diam. 1·5 mm.

Hab. Shimbi Hills, British East Africa.

The name *Phasis* being preoccupied in another branch of Zoology it becomes necessary to substitute a new name for the molluscan genus until now bearing this appellation, of which the type species is *P. menkeana*, Pfr., from the Cape of Good Hope; I therefore propose the name *Phortion* for this group.

Rachis hieroglyphicus, sp. n. (Fig. 16.)

Shell turbinately ovate, extreme apex black, the remainder of the shell whitish, painted on the upper whorls with two spiral rows of squarish, dark chestnut blotches, between which occurs a narrow, indistinct, interrupted band of a paler colour, the last whorl ornamented with numerous narrow bands of chestnut and black, the upper of these being much interrupted, the lower ones less so until the last which is continuous, the spaces between the last three being occupied with black transverse flame-markings and streaks which, together with the spiral bands, present the appearance of hieroglyphics, columellar region stained with greyish brown; whorls 6, very minutely sculptured with indistinct spiral striæ; sutures impressed; columellar perforation extremely narrow; columella descending almost vertically and extending above into a very thin, scarcely perceptible, callus; labrum acute; aperture squarely ovate; interior of shell showing the curious painting quite as clearly as the exterior.

Alt. 16, diam. maj. 10·75 mm.

Aperture: alt. 8, diam. 6·25 mm.

Hab. Shimbi Hills, British East Africa.

Rachis vicinus, sp. n. (Fig. 17.)

Shell rimate, acutely conical, thin, pale straw-colour, encircled by three rather narrow bands of reddish purple, apex purplish; whorls 6, not very convex, very indistinctly and minutely spirally striate; sutures impressed; columella expanded over the very narrow fissure, descending nearly vertically and diffused into a thin whitish callus which joins the lip above; aperture very broadly, inversely auriform.

Alt. 15·75, diam. maj. 9·5, diam. min. 7 mm.

Aperture: alt. 7, diam. 3·5 mm.

Hab. Shimbi Hills, British East Africa.

Somewhat resembling *R. bengalensis*, Lk., a common East Indian form, but more conical and narrower in shape.

Buliminus (?) *margueritæ*, sp. n. (Fig. 18.)

Shell fusiform, thin, horny, pale brown; whorls 6, regularly increasing, somewhat convex, sculptured with closely set, oblique, transverse costulæ, the last whorl bearing a rather indistinct, narrow, semitransparent band at the periphery; sutures impressed and slightly crenellated by the terminations of the transverse costulæ; umbilicus narrow, partly concealed by the reflection of the columella; columella descending in a slight curve; labrum thin, slightly reflexed; aperture broadly inversely auriform; interior of shell showing the transverse sculpture through the test.

Alt. 10, diam. maj. 4 mm.

Aperture: alt. 3·5, diam. 2 mm.

Hab. Shimbi Hills, British East Africa.

Buliminus (?) *tribulationis*, sp. n. (Fig. 19.)

Shell differing from *B.* (?) *margueritæ* in its larger size and somewhat finer sculpture, the whorls, of which there is one more in the present species, are rather flatter and the transparent peripheral band is lacking.

Alt. 12·25, diam. maj. 5 mm.

Aperture: alt. diam. 2·25 mm.

Hab. Shimbi Hills, British East Africa.

Achatina iredalei, sp. n. (Fig. 20.)

Shell ovately fusiform, moderately solid, the earlier whorls pink, the latter covered with a brownish periostracum, and painted with broad, irregular, somewhat distant and occasionally much broken, transverse chestnut bands and flame-markings; whorls 7, regularly increasing, rather flattened, decussately sculptured, the sculpture becoming obsolete towards the base; sutures impressed, crenellate and narrowly margined below; columella bluish white, a very thin callus joining it with the sutural region just inside the aperture, slightly excavated, descending nearly vertically; labrum simple, acute; aperture rather narrowly, elongately ovate, interior of shell bluish white.

Alt. 101, diam. 41 mm.

Aperture: alt. 48, diam. 29 mm.

Hab. Shimbi Hills, British East Africa.

Curvella caloraphe, sp. n. (Fig. 21.)

Shell ovately fusiform, perforate, rather solid, whitish, glossy; whorls 5, the first four flattish and finely sculptured with transverse, moderately closely set, arcuate striæ, the last more convex and sculptured with much more closely set, arcuate striæ; sutures impressed, broadly margined below, especially on the last whorl; umbilicus narrow, deep, partly concealed by the reflexion of the columella; columella white, outwardly expanded, bulging inwardly towards the centre, excavated below and diffused above into a thin, ill-defined, parietal callus which reaches the upper margin of the labrum; labrum acute, slightly reflexed below, dilated in front and then receding above; aperture inversely auriform; interior of shell white, showing the closely set, transverse sculpture through the test.

Alt. 11·5, diam. maj. 6·5, diam. min. 5 mm.

Aperture: alt. 7, diam. 3 mm.

Hab. Shimbi Hills, British East Africa.

Differing from *P. nyassana*, Smith, chiefly by its wider aperture, excavated columella, and in having the sutures noticeably margined, which is not the case in that species.

Curvella mathildæ, sp. n. (Fig. 22.)

Shell fusiform, thin, transparent, yellowish white, with blunt apex; whorls 5½, sculptured with rather fine, arcuate, transverse growth striæ; sutures impressed, narrowly margined below; columella white, narrowly reflexed, descending vertically; labrum simple; aperture elongately, inversely auriform; interior of shell having a white streak at the base.

Alt. 11·5, diam. maj. nearly 5 mm.
Aperture: alt. 5, diam. 2 mm.
Hab. Usagara, German East Africa.

Curvella pertranslucens, sp. n. (Fig. 23.)

Shell fusiform, thin, transparent, whitish, horny, polished; whorls 6, sculptured with somewhat distant, transverse, arcuate growth striæ; sutures impressed, very narrowly margined below; perforation almost concealed by the reflexion of the columella; columella very slightly bulging in the middle, descending almost vertically; labrum acute, receding above and below; aperture inversely auriform.

Alt. 11, diam. maj. 4·25 mm.
Aperture: alt. 4·25, diam. 1·75 mm.
Hab. Shimbi Hills, British East Africa.

Curvella shimbiense, sp. n. (Fig. 24.)

Shell darker in colour, having one whorl more, and much more slender than *C. pertranslucens*, the whorls are rather flatter and the aperture shorter and narrower than in that species.

Alt. 10·5, diam. maj. 3·5 mm.
Aperture: alt. 3, diam. 1 mm.
Hab. Shimbi Hills, British East Africa.

Homorus ordinarius, sp. n. (Fig. 25.)

Shell elongately subulate, transparent brown, polished, shining, with mammillary apical whorls; whorls 11½, rather flattened, somewhat puckered at the sutures, otherwise smooth, but for lines of growth; sutures impressed, narrowly margined below; columella whitish, widely excavated above, descending in an oblique curve and diffused into a thin callus which joins the lip above; labrum simple; aperture ovate.

Alt. 18·5, diam. maj. 3·75 mm.
Aperture: alt. 3, diam. 1·75 mm.
Hab. Shimbi Hills, British East Africa.

Differing from *S. nigella*, Morl.[*], from Angola, in its larger size, more convex whorls, smoother texture, higher and narrower aperture, and less curved columella.

BIOMPHALARIA, gen. n.

Shell subdiscoidal, planulate with concave spire, last whorl very large; umbilicus open, but shallow; aperture gaping; labrum greatly receding below.

Type of genus, *B. smithi*, Preston.

A curious form belonging to the Limnæidæ and which, judging from the shell alone, should be placed near *Choanomphalus* from Lake Baikal.

Biomphalaria smithi, sp. n. (Figs. 26, 26 A.)

Shell subdiscoidal, depressed with concave spire, somewhat polished, whitish semitransparent in the peripheral region, tinged with pale reddish brown above and opaquely white below; whorls 3½, lightly, but closely, marked with radiate lines of growth; sutures rather deeply impressed; umbilicus wide, shallow, slightly arched over in front by the labrum; labrum acute, obliquely obtuse-angled near the umbilical area, excavated and receding below, dilated in front, a rather coarse parietal callus joining the margins; aperture broadly ovate; interior of shell whitish, tinged with very pale reddish brown above, polished, shining.

Alt. 4, diam. maj. 9·5, diam. min. 7·25 mm.

Aperture: alt. 5, diam. 4·5 mm.

Hab. Lake Albert Edward (*J. E. S. Moore*).

Type in British Museum.

Aferulus lugubris, sp. n. (Fig. 27.)

Shell depressedly conoidal, solid, covered with a dark brown, finely laminiferous periostracum; whorls 4½, somewhat inflated; sutures deeply impressed; umbilicus moderately wide, deep; peristome continuous, acute, slightly reflexed above; aperture large, nearly circular; interior of shell polished, greyish white; operculum laminiferous, slightly concave, with central nucleus and having about a dozen convolutions.

Alt. 21, diam. maj. 29, diam. min. 21 mm.

Aperture: alt. 14, diam. 13·75 mm.

Hab. Shimbi Hills, British East Africa.

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[*] Voy. Welwitsch, 1857, p. 80, pl. v. fig. 3.

Tropidophora concinna, sp. n. (Fig. 28.)

Shell turbinately conic, flesh-colour, painted on the last whorl with a moderately broad peripheral band of reddish purple, above which appear several indistinct and extremely narrow bands of a lighter colour; whorls 4, convex, the apical whorls smooth, the later whorls sculptured throughout with rather closely set, revolving liræ; sutures incised, umbilicus rather narrow, deep, partly concealed by the reflexion of the peristome; peristome continuous, narrowly dilated, slightly reflexed in the umbilical region; aperture nearly circular.

Alt. 11, diam. maj. 11, diam. min. 8·25 mm.

Aperture: alt. 5·5, diam. 5 mm.

Hab. Shimbi Hills, British East Africa.

EXPLANATION OF THE PLATES.

PLATE VII.

Fig. 1. *Gibbulina expatriata*, sp. n. Enlarged.
Fig. 2. *Ennea quadrilateralis*, sp. n. Natural size.
Fig. 3. —— *gwendolineæ*, sp. n. Enlarged, × 7.
Fig. 4. —— *marionæ*, sp. n. Enlarged, × 7.
Fig. 5. —— *jod*, sp. n. Enlarged, × 7.
Fig. 6. —— *sperabile*, sp. n. Enlarged, × 7.
Fig. 7. —— *delicatula*, sp. n. Enlarged, × 7.
Fig. 8. —— *radius*, sp. n. Enlarged, × 7.
Fig. 9. *Martensia gwendolinæ*, sp. n. Enlarged.
Fig. 10. —— *martensiana*, sp. n. Enlarged.

PLATE VIII.

Fig. 11. *Martensia monozonata*, sp. n. Enlarged.
Fig. 12. —— (?) *shimbiense*, sp. n. Enlarged.
Fig. 13. *Thapsia exasperata*, sp. n. Enlarged.
Fig. 14. —— *insulsa*, sp. n. Enlarged, × 7.
Fig. 15. *Phortion ariel*, sp. n. Enlarged.
Fig. 16. *Rachis heiroglyphicus*, sp. n. Enlarged.
Fig. 17. —— *vicinus*, sp. n. Enlarged.
Fig. 18. *Buliminus* (?) *margueritæ*, sp. n. Enlarged.
Fig. 19. —— (?) *tribulationis*, sp. n. Enlarged.

PLATE IX.

Fig. 20. *Achatina iredalei*, sp. n. Natural size.
Fig. 21. *Curvella caloraphe*, sp. n. Enlarged.
Fig. 22 —— *mathildæ*, sp. n. Enlarged.
Fig. 23. —— *pertranslucens*, sp. n. Enlarged.
Fig. 24. —— *shimbiense*, sp. n. Enlarged.
Fig. 25. *Homorus ordinarius*, sp. n. Enlarged.
Figs. 26, 26 A. *Biomphalaria smithi*, sp. n. Enlarged.
Fig. 27. *Aferulus lugubris*, sp. n. Natural size.
Fig. 28. *Tropidophora concinna*, sp. n. Enlarged.

THE ANNALS

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[EIGHTH SERIES.]

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LXI.—*On a large Collection of Fishes made by Dr. W. J. Ansorge in the Quanza and Bengo Rivers, Angola.* By G. A. Boulenger, F.R.S.

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The collection on which I have the pleasure to report is one of the largest and most interesting which it has been my privilege to work out. It consists of over 1100 specimens, excellently preserved in spirit, and representing 52 species, 30 of which appear to be new to science.

Very little was previously known of the fish-fauna of the rivers of Angola, and the present collection is of the greatest importance from the point of view of geographical distribution, as it shows the affinities of these fishes to be more with East Africa than with the Congo and Gaboon, at least so far as the Cyprinids are concerned, several of the species here described as new having their nearest allies in Abyssinia and neighbouring parts of East Africa. The Bynni group of *Barbus*, to which seven species are added, is, in the present state of our knowledge, unrepresented in the Congo, and very scantily in the other rivers emptying in the Atlantic. The remarkable genus *Xenopomatichthys*, of which a new species is described, was established a few years ago for a single species from Mozambique, the affinities of which were regarded as uncertain. One of the new fishes is regarded as the type of a new genus (*Nematogobius*).

Dr. Ansorge, who has on previous occasions added so much to our knowledge of African Ichthyology, deserves the highest praise for this new achievement. He has kindly furnished me with the following particulars concerning the manner in which the collection was made:—

"The collection was made from three rivers (the Quanza, the Lucalla, and the Bengo), two lakes (Lake Kilunda and Lake Rumango), and swamps produced by overflow of these rivers during the rainy season. Some of these swamps dry up entirely during the dry season, so that during one part of the year natives capture fish with their creels and casting-nets, and during another part of the year gather a harvest of maize from the identical spot.

"An English minnow casting-net, two German fish-cord bag-nets, three French wire-creels, and over fifteen pounds of Portuguese dynamite cartridges were used. The usefulness of this variety of means of capture is evident from the fact that it was only through the casting-net that the new *Syngnathus* was got from the Quanza and the new Gobiid from the Bengo. Again, but for the German bag-net, left in the river night after night, the single specimen of the rare *Marcusenius pauciradiatus* (hitherto unrepresented in the British Museum collection) would not have been secured. Finally, only by the dynamite cartridges were captured the new *Xenopomatichthys*, the new *Physailia*, the new *Barbus rhynchotus* and *Barbus lucius*, and the new *Petrocephalus cunganus*.

"The Lucalla River, though only a tributary of the Quanza, is a very long, winding, and broad river; its course is broken by three separate falls and by stretches of rapids. Just above the rapids, close to the railway station also called 'Lucalla,' the river yielded an extraordinary number of new species both of *Varicorhinus* and of *Barbus*, also the new *Xenopomatichthys* and the new *Labeo rocadasi*. Whereas a deep quiet pool, about an hour by canoe above Kalenge, where the River Lucalla is broad and shallow, gave the new *Odaxothrissa* and five specimens of *Marcusenius ansorgii*.

"The Bengo River is quite distinct from the Quanza and is much smaller; but the new *Nematogobius ansorgii* as well as the single specimen of *Marcusenius pauciradiatus* were only captured here. The lakes Kilunda and Rumango are connected with the Bengo and abound with the two new species of *Petersius* and the pretty little new *Barbus musumbi*.

"Exploration of the Quanza River at Cunga, Dondo, and Cambambe gave also valuable results. The Cichlid perches *Tilapia flavomarginata* and *Tilapia cabræ* are very delicious eating; they are plentiful at Cunga and form a highly appreciated commercial commodity, both fresh and sun-dried, under the local names of 'shopa' and 'cacusso.' The single specimen of the new *Petrocephalus cunganus* as well as the single specimen of the large red-brown *Lutjanus eutactus* were captured at Cunga. The casting-net secured at Dondo the single specimen of the new *Syngnathus*, the two tiny specimens of *Haplochilus macrurus*, and quite a number of the new *Barilius*. Cambambe is a mountainous region where the River Quanza forms rapids; below these rapids the new *Physailia* and the two new species of *Chrysichthys* were obtained by using dynamite.

"In recognition of the kind assistance given by His Excellency Lieut.-Colonel José Augusto Roçadas (Governor-General of Angola) and by Senhor Manoel Francisco da Costa Serão (Director of the Companhia de Camino de Ferro Atravers Africa), three of the new species have been named *Labeo rocadasi*, *Barbus rocadasi*, and *Chrysichthys seraoi* respectively. Similarly, *Barbus rosæ* has been named in honour of the Vicar Padre Anastacio Luis Rosa for helpful courtesy during a seven years' friendship."

Mormyridæ.

1. *Petrocephalus simus*, Sauv.

Quanza River at Cunga and Lucalla River at Kalenge.
Native name: Dilele.

2. *Petrocephalus cunganus*, sp. n.

Depth of body equal to length of head, 3½ times in total length. Head slightly longer than deep, with convex upper profile; snout rounded, strongly projecting beyond mouth, ⅕ length of head; mouth below anterior border of eye, its width ¼ length of head; teeth bicuspid, 11 in upper jaw, 24 in lower; nostrils near lower border of eye; eye ¼ length of head, ⅔ interorbital width. Dorsal 27, originating above first ray of anal; its length 1½ times in its distance from head and a little greater than its distance from caudal. Anal

32, equally distant from base of ventral and from base of caudal. Pectoral pointed, $\frac{2}{3}$ length of head, not quite twice as long as ventral, extending beyond base of latter. Caudal scaled at the base, upper lobe pointed, lower rounded. Caudal peduncle 3 times as long as deep, $\frac{3}{4}$ length of head. 47 scales in the lateral line, $\frac{12}{14}$ in transverse series on body, $\frac{16}{14}$ in transverse series between dorsal and anal, 12 round caudal peduncle. Brown above, silvery beneath; fins brownish.

Total length 110 mm.

A single specimen from the Quanza River at Cunga.

Near *P. simus*, Sauv., but agreeing with *P. degeni* in the anal not originating in front of the dorsal, and in the more elongate body.

3. *Marcusenius ansorgii*, Blgr.

Quanza River at Dondo, Lucalla River at Kalenge and Lucalla.

This species, originally described from half-grown specimens, attains a length of 190 millim.

4. *Marcusenius pappenheimi*, sp. n.

Depth of body $3\frac{2}{3}$ to 4 times in total length, length of head 4 to $4\frac{3}{4}$ times. Head slightly longer than deep; snout rounded, $\frac{1}{4}$ length of head, slightly projecting beyond mouth; mouth small, subinferior, its width $\frac{1}{5}$ to $\frac{1}{4}$ length of head; teeth notched, 5–7 in upper jaw, 6–8 in lower; posterior nostril a little below level of centre of eye; eye about $\frac{2}{3}$ length of snout and $\frac{1}{2}$ interorbital width. Dorsal 20–22, its length about $\frac{1}{2}$ its distance from head, originating above 4th to 6th ray of anal. Anal 25–28, a little longer than dorsal, nearly equally distant from base of ventral and from base of caudal. Pectoral pointed, $\frac{3}{4}$ to $\frac{4}{5}$ length of head, reaching base of ventral. Caudal densely scaled in the basal half, with obtusely pointed lobes. Caudal peduncle 3 to $3\frac{1}{2}$ times as long as deep, as long as head. 71–80 scales in lateral line, $\frac{14\text{–}16}{21\text{–}24}$ in transverse series on body, $\frac{11\text{–}13}{11\text{–}13}$ in transverse series between dorsal and anal, 12–14 round caudal peduncle. Brown; a more or less indistinct dark vertical bar between anterior part of dorsal and anal.

Total length 80 to 180 mm.

Numerous specimens from the Quanza River at Cunga.

This species, allied to *M. marchii*, Sauv., *kingsleyæ*, Gthr., and *sphecodes*, Sauv., is dedicated to Dr. P. Pappenheim, of the Berlin Museum, who has contributed to our knowledge of the Mormyrids.

5. *Marcusenius pauciradiatus*, Stdr.

A single specimen, 190 mm. long, from the Bengo River at Cabiri.

Native name: Libi.

Clupeidæ.

6. *Pellonula vorax*, Gthr.

Quanza River at Cambambe and Dondo; Bengo River at Cabiri.

7. *Odaxothrissa ansorgii*, sp. n.

Depth of body equal to length of head, 3 to 3½ times in total length. Snout as long as eye, which is 3 or 3¼ times in length of head and exceeds interorbital width; chin strongly projecting; maxillary extending to below centre of eye. Gill-rakers moderately elongate, 23–25 on lower part of anterior arch. Dorsal 15–16, originating immediately behind vertical of base of ventral, at equal distance from end of snout or anterior border of eye and from caudal. Anal 17–19. Pectoral ⅔ length of head, not reaching ventral. Caudal deeply forked, with pointed lobes. Caudal peduncle as long as deep. 40–45 scales in longitudinal series, 16–17 in transverse series; 15–16 keeled scutes between isthmus and ventrals, 10–12 between ventrals and anal. Upper half, with dorsal and base of caudal pale olive-green in life, lower half and other fins white; a broad silvery band along each side.

Total length 160 mm.

Several specimens. Quanza River at Cambambe; Lucalla River at Kalenge; Bengo River at Cabiri.

Native name: Mabemba.

Well distinguished from the type of the genus by the smaller number of rays in the anal fin (17–19 instead of 21–22) and of scutes in the abdominal serrature (15–16 + 10–12 instead of 17–18 + 9–10).

Kneriidæ.

8. *Xenopomatichthys ansorgii*, sp. n.

Depth of body equal to length of head, 5⅓ times in total length. Snout rounded, nearly as long as eye, which is perfectly lateral, visible from below as well as from above, 3⅓ times in length of head and 1½ times in interorbital width; width of mouth equal to diameter of eye; sides and lower surface of head with conical horny tubercles; cup-shaped apparatus on operculum much larger than eye, followed, on the scapular region, by a large lamellar pad (18 or 19 lamellæ). Dorsal III 7, originating at equal distance from eye and from root of caudal, well behind vertical of base of ventral. Anal III 8–9. Pectoral shorter than head. Caudal deeply notched, crescentic. Caudal peduncle half as deep as long *. Scales longitudinally striated, 110–120 in lateral line, 16–18 between dorsal and lateral line, 10–11 between lateral line and ventral. Pale brownish above, yellowish beneath, with scattered dark brown dots and a series of round blackish spots, connected by a dark brown lateral band, just above the lateral line; fins uniform whitish.

Total length 67 mm.

Two specimens from the Lucalla River at Lucalla.

This fish, one of the most interesting of Dr. Ansorge's discoveries in Angola, shows *Xenopomatichthys* to be unquestionably related to *Kneria*. *X. ansorgii* is easily distinguished from *X. auriculatus*, Pellegrin, by the longer body, the number of branched rays in the dorsal (7 instead of 8) and anal (8–9 instead of 6–7), and the number of scales in the lateral line (110–120 instead of 60–65).

Characinidæ.

9. *Alestes ansorgii*, sp. n.

Depth of body 3¾ to 4½ times in total length, length of head 4¼ to 5 times. Head 1¾ to 2¼ times as long as broad, 1⅕ to 1¼ times as long as deep; snout as long as or shorter than eye, which is lateral and 2½ (young) to 3½ times in length of head ; adipose eyelid well developed ; interorbital region convex, its width $2\frac{2}{3}$ to 3 times in length of head; maxillary not extending to below anterior border of eye ; 14 $\binom{6}{8}$ teeth in upper jaw, 10 $\binom{8}{2}$ in lower ; lower border of second suborbital as long as eye. Gill-rakers long and slender, 15 to 18 on lower part of anterior arch. Dorsal II 8, originating above ventral, at equal distance from end of snout and from caudal, longest ray $\frac{4}{5}$ to once length of head. Anal III 17–18. Pectoral $\frac{3}{4}$ to once length of head, not reaching ventral. Caudal forked, with long pointed lobes. Caudal peduncle $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as deep. Scales 37–40 $\frac{5\frac{1}{2}-6\frac{1}{2}}{3\frac{1}{2}}$, $1\frac{1}{2}$ between lateral line and ventral. Steel-blue on the back, silvery-white on the sides and below ; fins greyish, ventrals, anal, and caudal yellow or orange at the base ; pectoral and ventral often with a large black or blackish blotch.

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* In the description of *X. auriculatus* in Brit. Mus. Cat. Afr. Fish. i. p. 172, "Caudal peduncle half as long as deep" is a *lapsus calami*, and should be corrected to "Caudal peduncle half as deep as long."

Numerous specimens, 85 to 270 mm. long, from the Quanza River at Cunga and Dondo, and from the Lucalla River at Lucalla.

Native name : Kitete.

Very closely allied to *A. macrophthalmus*, Gthr. ; distinguished by larger scales (37–40 $\frac{5\frac{1}{2}-6\frac{1}{2}}{3\frac{1}{2}}$, $1\frac{1}{2}$, instead of 39–45 $\frac{6\frac{1}{2}-8\frac{1}{2}}{8\frac{1}{2}}$, 2).

10. *Petersius ansorgii*, sp. n.

Depth of body $2\frac{1}{2}$–$2\frac{3}{4}$ times in total length, length of head $3\frac{1}{2}$ to 4 times. Head as long as deep, with slightly concave upper profile ; lower jaw not projecting beyond upper ; snout much shorter than eye, which is $2\frac{1}{2}$ to $2\frac{2}{3}$ times in length of head and equals interorbital width ; maxillary extending to below anterior border of eye ; outer premaxillary teeth 4, alternating with those of the inner row, 8 in number ; 8 teeth in lower jaw. Gill-rakers moderate, 18–20 on lower part of anterior arch. Dorsal II 8, originating above base of ventral, some of the rays produced into long filaments in males. Anal II–III 20–23, pointed in males, median ray produced into a filament. Pectoral as long as or a little shorter than head, reaching or nearly reaching ventral. Caudal forked. Caudal peduncle as long as deep. Scales 81–33 $\frac{6\frac{1}{2}-7\frac{1}{2}}{8\frac{1}{2}}$, $1\frac{1}{2}$–2 between lateral line and ventral. Reddish brown above, more red on the sides, approaching vermilion *, silvery beneath, with a more or less distinct dark lateral band extending on the caudal fin, and a vertical dark bar above pectoral; fins greyish, tinged with vermilion.

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* This vermilion soon disappeared after staining the spirit in which the specimens were preserved.

Numerous specimens, 38 to 60 mm. long, from the Bengo River at Cabiri and from Lake Kilunda.

Native name: Kamakanja.

Most nearly related to *P. hilgendorfi*, Blgr.; distinguished by a shorter body, the shape of the anal fin in the males, more numerous gill-rakers, and fewer scales in the lateral line (31–33 instead of 35–36).

11. *Petersius ubalo*, sp. n.

Depth of body 8 to 3½ times in total length, length of head 3⅔ to 4 times. Head as long as deep, with slightly concave upper profile; lower jaw not projecting beyond upper; snout much shorter than eye, which is 2½ to 2⅔ times in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with those of the inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers rather long, 16–18 on lower part of anterior arch. Dorsal II 8, originating above base of ventral, longest ray as long as head. Anal III 18–20. Pectoral as long as or a little shorter than head, not reaching ventral. Caudal forked. Caudal peduncle as long as deep. Scales 30–34 $\frac{6\frac{1}{2}-7\frac{1}{2}}{8\frac{1}{2}}$, 2 between lateral line and ventral. Yellowish green above, silvery beneath; fins whitish; a more or less distinct dark lateral band, terminating in a rhomboidal black blotch on caudal peduncle and median rays of caudal fin.

Numerous specimens, 30 to 45 mm. long, from Lakes Rumango and Kilunda.

Native name: Ubalo.

Closely allied to the preceding species; distinguished by a more elongate body, longer gill-rakers, fewer branched rays in the anal fin (18–20 instead of 20–23), and especially by the more normal shape of the dorsal and anal fins.

Cyprinidæ.

12. *Labeo rocadasi*, sp. n.

Body moderately compressed, its depth equal to or a little less than length of head, 4 to 4¾ times in total length. Head 1½ to 1¾ times as long as broad; snout rounded or obtusely pointed, strongly projecting, more or less swollen, often with a more or less distinct curved transverse groove above, its length ½ or a little more than ½ length of head (a little less in the young); eye small, supero-lateral, 4 (young) to 6 times in length of head; interorbital width ⅖ to ½ length of head; width of mouth ½, or a little less than ½, length of head; lips strongly developed, upper straight-edged, lower more or less expanded and bordered in front by a fringe of papillæ, the posterior border more or less distinctly festooned; inner surface of lips with small papillæ forming numerous transverse plicæ; rostral flap large, completely detached at the sides, the edge more or less distinctly festooned or denticulate; a small barbel, concealed under folds of mouth; more or less developed horny tubercles (or their scars) on the snout. Dorsal III 10 (rarely 9 or 11), equally distant from end of snout or nostrils and from caudal, upper edge concave, last simple ray and first branched ray longest, as long as head or a little longer. Anal III 5, not reaching root of caudal. Pectoral as long as or a little longer than head, not reaching ventral; latter inserted below middle of dorsal. Caudal deeply emarginate. Caudal peduncle 1⅔ to 2 times as long as deep. Scales 39–42 $\frac{6\frac{1}{2}-7\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$, 4–5 between lateral line and ventral, 16 round caudal peduncle. Dark olive above, whitish beneath; fins greyish or bright red; young with a dark spot on each scale and a black blotch on caudal peduncle.

Numerous specimens, 40 to 250 mm. long, from the Quanza and Lucalla Rivers.

Closely allied to *L. forskalii*, Rüpp.; distinguished chiefly by the longer caudal peduncle.

13. *Labeo ansorgii*, Blgr.

Originally described from a single young specimen from Mossamedes, this species is represented in the present collection by numerous specimens, 50 to 190 mm. in length, from the Quanza and Bengo Rivers and Lake Kilunda.

Except for the presence of an anterior small and often quite rudimentary barbel, this species agrees closely with *L. forskalii*.

14. *Varicorhinus ensifer*, sp. n.

Depth of body 3½ to 4 times in total length, length of head 4⅓ to 5⅓ times. Snout rounded, a little broader than long, as long as or a little longer than eye, which is about 3 times in length of head and $1\frac{1}{2}$ to $1\frac{2}{3}$ times in interorbital width; mouth straight, its width about $\frac{1}{3}$ length of head, with a thick upper lip covered with round papillæ; similar papillæ behind the cutting-edge of the lower jaw; two barbels on each side, anterior minute, posterior about $\frac{1}{2}$ diameter of eye. Males with large horny spinose tubercles on sides of head and end of snout. Dorsal IV 10 (rarely 9 or 11), equally distant from eye and from caudal, last simple ray very strong, bony, not serrated, straight, $1\frac{1}{2}$ to $2\frac{1}{4}$ times length of head; border of fin strongly emarginate. Anal III 5, longest ray a little shorter or a little longer than head, sometimes reaching caudal, with nuptial tubercles in the males. Pectoral as long as or a little longer than head, not reaching ventral; latter inserted below anterior rays of dorsal. Caudal deeply forked. Caudal peduncle $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as deep. Scales 30–35 $\frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}}$, 2–$2\frac{1}{2}$ between lateral line and ventral, 12–14 round caudal peduncle. Olive-brown above, white beneath; fins bright red, edged with greyish.

Numerous specimens, measuring from 75 to 195 mm., from the Lucalla River at Lucalla.

15. *Varicorhinus stenostoma*, sp. n.

Depth of body $8\frac{1}{4}$ times in total length, length of head $4\frac{1}{4}$ times. Snout rounded, a little broader than long, a little shorter than eye, which is 3 times in length of head and equals interorbital width; mouth curved, its width $\frac{2}{7}$ length of head; no papillæ round the mouth; two barbels on each side, anterior about $\frac{1}{2}$, posterior $\frac{2}{3}$ diameter of eye. Dorsal IV 10, equally distant from centre of eye and from caudal, last simple ray very strong, bony, not serrated, straight, $1\frac{1}{3}$ times length of head; border of fin strongly emarginate. Anal III 5, longest ray $\frac{2}{3}$ length of head. Pectoral as long as head, not reaching ventral; latter inserted below middle of dorsal. Caudal deeply forked. Caudal peduncle $1\frac{2}{3}$ times as long as deep. Scales 41 $\frac{7\frac{1}{2}}{6\frac{1}{2}}$, 4 between lateral line and ventral, 16 round caudal peduncle. Brownish above, each scale with a dark spot, white beneath; fins whitish.

Total length 105 mm.

A single specimen from the Lucalla River at Lucalla.

16. *Varicorhinus varicostoma*, sp. n.

Depth of body $3\frac{2}{3}$ times in total length, length of head 5 times. Snout rounded, much broader than long, as long as eye, which is 3 times in length of head and 1⅔ times in interorbital width; mouth straight, its width ⅓ length of head, with a thick upper lip covered with round papillæ; smaller papillæ behind the cutting-edge of the lower jaw; a single barbel on each side, at angle of mouth, ½ diameter of eye. Dorsal IV 10, equally distant from centre of eye and from root of caudal, last simple ray very strong, bony, not serrated, straight, 1½ times length of head; border of fin strongly emarginate. Anal III 5, longest ray as long as head. Pectoral as long as head, not reaching ventral; latter inserted below anterior rays of dorsal. Caudal deeply forked. Caudal peduncle 1½ times as long as deep. Scales 35 $\frac{5\frac{1}{2}}{5\frac{1}{2}}$, 3 between lateral line and ventral, 14 round caudal peduncle. Dark brown above, yellowish beneath; fins dark grey.

Total length 170 mm.

A single specimen from the Lucalla River at Lucalla.

17. *Varicorhinus steindachneri*, sp. n.

Depth of body 3 to 3½ times in total length, length of head 3½ to 4½ times. Snout rounded, a little broader than long, as long as or a little longer than eye, which is 3 (young) to 4 times in length of head and 1⅓ to 1½ times in interorbital width; mouth straight, its width about ⅗ length of head; a minute, sometimes almost imperceptible, barbel at angle of mouth; a few conical tubercles on sides of snout. Dorsal IV 10 (rarely 9 or 11), equally distant from anterior border or centre of eye and from root of caudal, last simple ray very strong, bony, not serrated, straight or very feebly curved, 1 to 1⅓ times length of head; border of fin strongly emarginate. Anal III 5, longest ray ⅔ to ⅚ length of head. Pectoral as long as or a little shorter than head, not reaching ventral; latter inserted below middle of dorsal. Caudal deeply forked. Caudal peduncle 1½ to 1⅔ times as long as deep. Scales 30–35 $\frac{4\frac{1}{2}\text{–}5\frac{1}{2}}{5\frac{1}{2}}$, 3–3½ between lateral line and ventral, 12 (rarely 14) round caudal peduncle. Brown above, whitish beneath; fins dark grey, often tinged with red.

Numerous specimens, measuring from 50 to 190 mm., from the Lucalla River at Lucalla.

Named in honour of Dr. F. Steindachner, this species being very closely allied to the one described by him as *V. tornieri*.

18. *Varicorhinus latirostris*, sp. n.

Depth of body 3 to 3½ times in total length, length of head 4 to 4½ times. Snout rounded, 1⅔ to 2 times as broad as long, as long as or a little shorter than eye, which is 3 to 3⅓ times in length of head and 1½ to 1⅔ times in interorbital width; mouth straight, its width ⅖ to ½ length of head; a minute barbel at angle of mouth; a few, very small, conical tubercles on sides of snout. Dorsal IV 10 (rarely 11), equally distant from end of snout or nostrils and from root of caudal, last simple ray very strong, bony, not serrated, straight or very feebly curved, as long as or slightly longer than head; border of fin strongly emarginate. Anal III 5, longest ray a little shorter than head. Pectoral as long as or a little longer than head, not reaching ventral; latter inserted below anterior soft rays of dorsal. Caudal deeply forked. Caudal peduncle twice as long as deep. Scales 34–39 $\frac{5\frac{1}{2}-6\frac{1}{2}}{5\frac{1}{2}-6\frac{1}{2}}$, 3–3½ between lateral line and ventral, 14 (rarely 12) round caudal peduncle. Olive-brown above, whitish beneath; fins dark grey, often tinged with red.

Ten specimens, measuring 100 to 160 mm., from the Lucalla River at Lucalla.

The discovery of these five species nearly doubles the number of African species of the genus *Varicorhinus*, the principal characters of which are here contrasted:—

I. Two pairs of barbels; last simple ray of dorsal strong and ossified.

A. Spine of dorsal shorter than head; 9 branched rays in dorsal; posterior barbel as long as eye.

Sc. 29 $\frac{4\frac{1}{2}}{4\frac{1}{2}}$, 2, 12; caudal peduncle not longer than deep; ventral below anterior soft rays of dorsal .... *V. ansorgii*, Blgr.

Sc. 31 $\frac{4\frac{1}{2}}{4\frac{1}{2}}$, 2½, 12; caudal peduncle much longer than deep; ventral below middle of dorsal. *V. brucii*, Blgr.

B. Spine of dorsal longer than head; 10 (rarely 9 or 11) branched rays in dorsal.

Sc. 30–35 $\frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}}$, 2–2½, 12–14; mouth straight, with rounded papillæ in front and behind; posterior barbel about ½ diameter of eye; ventral below anterior rays of dorsal .... *V. ensifer*, Blgr.

Sc. 41 $\frac{7\frac{1}{2}}{6\frac{1}{2}}$, 4, 16; mouth curved, without papillæ; posterior barbel ⅔ diameter of eye; ventral below middle of dorsal .... *V. stenostoma*, Blgr.

II. One pair of barbels, sometimes very minute and hidden in the folds at angle of mouth.

A. 30–39 scales in lateral line; last simple ray of dorsal strong and ossified; 9 to 11 branched rays in the dorsal.

1. Snout much broader than long; rounded papillæ in front of and behind mouth.

Sc. 35 $\frac{5\frac{1}{2}}{5\frac{1}{2}}$, 3, 14; ventral below anterior rays of dorsal; barbel $\frac{1}{2}$ diameter of eye ...... *V. varicostoma*, Blgr.

2. Snout a little broader than long; barbel minute; ventral below middle of dorsal.

Sc. 31 $\frac{4\frac{1}{2}}{4\frac{1}{2}}$, $2\frac{1}{2}$, 12; eye $4\frac{2}{3}$ times in length of head .... *V. tornieri*, Stdr.

Sc. 30–35 $\frac{4\frac{1}{2}-5\frac{1}{2}}{5\frac{1}{2}}$, $3-3\frac{1}{2}$, 12–14; eye not more than 4 times in length of head .... *V. steindachneri*, Blgr.

3. Snout much broader than long; barbel minute; ventral below anterior soft rays of dorsal.

Sc. 30–35 $\frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$, 2–3, 12; eye 4 to 6 times in length of head....................... *V. beso*, Rüpp.

Sc. 34–39 $\frac{5\frac{1}{2}-6\frac{1}{2}}{5\frac{1}{2}-6\frac{1}{2}}$, $3-3\frac{1}{2}$, 12–14; eye 3 to $3\frac{1}{3}$ times in length of head..................... *V. latirostris*, Blgr.

B. More than 40 scales in lateral line.

Sc. 43–46 $\frac{8\frac{1}{2}-9\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$, 4–5, 16; dorsal with the last simple ray slender and flexible, followed by 10–11 branched rays .... *V. maroccanus*, Gthr.

Sc. 64–70 $\frac{13\frac{1}{2}-14\frac{1}{2}}{14\frac{1}{2}-15\frac{1}{2}}$, 9–10, 32–34; dorsal with the last simple ray strong and ossified, followed by 8–9 branched rays .... *V. tanganicæ*, Blgr.

19. *Barbus ensis*, sp. n.

Depth of body $3\frac{1}{2}$ to $4\frac{1}{4}$ times in total length, length of head $3\frac{1}{3}$ to $3\frac{3}{4}$ times. Snout rounded, 3 times in length of head; eye $2\frac{3}{4}$ to $3\frac{1}{2}$ times in length of head, interorbital width 3 to $3\frac{1}{4}$ times; mouth inferior, its width 4 times in length of head; lips moderately or rather strongly developed, lower continuous across chin, where it may form a rather long rounded lobe; two barbels on each side, anterior about $\frac{2}{3}$ length of eye, posterior as long as eye or slightly longer. Dorsal IV 9, equally distant from centre or anterior border of eye and from root of caudal, border concave, last simple ray extremely strong, bony, not serrated, straight, $1\frac{1}{4}$ to $1\frac{2}{3}$ times length of head. Anal III 5, not reaching caudal. Pectoral shorter than head, not reaching ventral; base of latter below anterior rays of dorsal. Caudal peduncle twice as long as deep. Scales finely striated longitudinally, 36–40 $\frac{5\frac{1}{2}-7\frac{1}{2}}{5\frac{1}{2}}$, 3 between lateral line and ventral, 12–14 round caudal peduncle. Silvery, back brownish; fins sometimes tinged with red.

Fifteen specimens, measuring from 55 to 140 mm., from the Lucalla River at Lucalla.

Most nearly related to *B. bynni*, Forsk., and *B. ruspolii*, Vincig.; distinguished from both by the proportions of the head and body, the larger eye, the more anterior position of the dorsal fin, and from the latter by the higher number of scales in the lateral line.

20. *Barbus rocadasi*, sp. n.

Depth of body 3 to 3½ times in total length, length of head 3½ to 4 times. Snout rounded, 2¾ to 3¼ times in length of head; eye 3 (young) to 5 times in length of head, interorbital width 2¾ to 3 times; mouth inferior, its width 3 to 3⅔ times in length of head; lips moderately developed, lower continuous across chin (sometimes interrupted in the young), but not forming a median lobe; two barbels on each side, anterior a little shorter than posterior, which is as long as or a little longer than eye. Dorsal III–IV 9 (rarely 8 or 10), equally distant from anterior or posterior border of eye and from caudal, border concave, last simple ray very strong, bony, not serrated, straight or feebly curved, ⅗ to once length of head. Anal III 5, not reaching caudal. Pectoral as long as or a little shorter than head, not reaching ventral; base of latter below anterior soft rays of dorsal. Caudal peduncle 1⅓ to 1½ times as long as deep. Scales finely striated longitudinally, 30–35 $\frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}}$, 2½–3 between lateral line and ventral, 12 round caudal peduncle. Olive-brown above, scales edged with darker, whitish beneath; fins dark in the adult, orange at the base, ventrals and anal edged with yellow or orange.

Numerous specimens, measuring 65 to 350 mm., from the Quanza and Lucalla Rivers.

This species may be placed near *B. duchesnii*, Blgr., from Abyssinia; distinguished by shorter barbels.

21. *Barbus gulielmi*, sp. n.

Depth of body 3¾ to 4 times in total length, length of head 3⅔ to 4 times. Snout obtusely pointed, 3 times in length of head; eye 3⅓ times in length of head, interorbital width 3 to 3⅓ times; mouth inferior, its width 4 to 4⅓ times in length of head; lips feebly developed, lower continuous across chin; two barbels on each side, anterior a little shorter than posterior, which measures 1 to 1⅖ diameters of eye. Dorsal III 8–9, equally distant from anterior border or centre of eye and from caudal, border concave, last simple ray very strong, bony, not serrated, as long as or a little shorter than head. Anal III 5, not reaching caudal. Pectoral a little shorter than head, not reaching ventral; base of latter below anterior soft rays of dorsal. Caudal peduncle 1⅔ to 2 times as long as deep. Scales finely striated longitudinally, 29–31 $\frac{4\frac{1}{2}}{4\frac{1}{2}}$, 2–2½ between lateral line and ventral, 12 round caudal peduncle. Brownish above, silvery white beneath, the scales on the upper parts blackish at the base; fins greyish.

Three specimens, measuring 110 to 150 mm., from the Quanza River at Dondo.

This species, named after Dr. William J. Ansorge, is distinguished from the preceding by the more slender body, the longer caudal peduncle, the more pointed snout, and the narrower mouth.

Native name: Quangalatunda.

22. *Barbus girardi*, sp. n.

Depth of body 3 to 3½ times in total length, length of head 3½ to 4⅓ times. Snout rounded, 3⅓ to 3½ times in length of head; eye 3 (young) to 4 times in length of head, interorbital width 2½ to 2⅔ times; mouth inferior, its width 3½ to 4 times in length of head; lips rather feebly developed, lower restricted to the sides; two barbels on each side, subequal, or posterior a little longer, 1⅓ to 1½ diameters of eye. Dorsal IV 10, equally distant from anterior or posterior border of eye and from caudal, border concave, last simple ray very strong, bony, not serrated, 1 to 1½ times length of head. Anal III 5, reaching caudal in the adult. Pectoral as long as head, nearly reaching ventral; latter below anterior soft rays of dorsal. Caudal peduncle 1⅔ times as long as deep. Scales finely striated longitudinally, 40–44 $\frac{7\frac{1}{2}-8\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$, 3½–4½ between lateral line and ventral, 16–18 round caudal peduncle. Brownish above, the scales darker at the base, whitish beneath; all the fins of a rich red in life.

11 specimens, measuring from 60 to 300 mm., from the Lucalla River at Lucalla.

This species, named after Dr. Albert Girard, Director of the Lisbon Museum, is allied to *B. intermedius*, Rüpp., but distinguished by smaller scales.

23. *Barbus rhinophorus*, sp. n.

Depth of body 4 to $4\frac{1}{3}$ times in total length, length of head $3\frac{1}{2}$ to $3\frac{2}{3}$ times. Snout pointed, terminating in a rounded dermal pad projecting strongly beyond the mouth, its length $2\frac{1}{2}$ times in length of head; eye 4 to $4\frac{1}{3}$ times in length of head, interorbital width $3\frac{2}{3}$ to 4 times; mouth inferior, its width 4 to $4\frac{1}{3}$ times in length of head; lips rather strongly developed, not extending across chin; a single barbel on each side, as long as or slightly longer than eye; sides of snout with scattered, very small, granular nuptial tubercles. Dorsal III 9, equally distant from nostrils or anterior border of eye and from caudal, last simple ray very strong, bony, not serrated, slightly longer than head. Anal III 5, not reaching caudal. Pectoral $\frac{3}{4}$ length of head, not reaching ventral; latter below middle of dorsal. Caudal peduncle twice as long as deep. Scales finely striated longitudinally, $30\text{–}32\frac{4\frac{1}{2}}{4\frac{1}{2}}$, 2 between lateral line and ventral, 12 round caudal peduncle. Brownish above, each scale blackish at the base, whitish beneath; fins red.

Total length 150 mm.

Two specimens from the Lucalla River at Lucalla.

24. *Barbus rosæ*, sp. n.

Depth of body $3\frac{1}{3}$ to $3\frac{2}{3}$ times in total length, length of head $3\frac{1}{2}$ to 4 times. Snout rounded, 3 to $3\frac{1}{3}$ times in length of head; eye 3 to $3\frac{1}{2}$ times in length of head, equal to interorbital width; mouth inferior, lower jaw with sharp cutting-edge *; lips feebly developed, lower restricted to the sides; a single barbel on each side, $\frac{3}{5}$ to $\frac{2}{3}$ diameter of eye. Dorsal III 9, equally distant from anterior border or centre of eye and from caudal, border concave; last simple ray very strong, bony, as long as or a little longer than head. Anal III 5, not reaching caudal. Pectoral a little shorter than head, not reaching ventral; latter below middle of dorsal. Caudal peduncle nearly twice as long as deep. Scales finely striated longitudinally, $30\text{–}33\frac{4\frac{1}{2}\text{–}5\frac{1}{2}}{4\frac{1}{2}}$, $2\frac{1}{2}$ between lateral line and ventral, 12 round caudal peduncle. Olive above, yellowish beneath; a blackish lateral band, terminating in a large black spot at the base of the caudal; fins orange.

Five specimens, measuring 55 to 95 mm., from the Lucalla River at Lucalla.

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* In the larger specimens only.

This species and the preceding are closely related, and constitute an isolated group, owing to the presence of a single barbel combined with the characters of the allies of *B. bynni.*

25. *Barbus lucius*, sp. n.

Depth of body 4⅓ to 4½ times in total length, length of head 3¼ to 3⅓ times. Head nearly 3 times as long as broad; snout rounded, 3 to 3½ times in length of head; eye 3½ (young) to 5 times in length of head, interorbital width 4 to 4½ times; mouth terminal, or lower jaw projecting, its width 3½ to 4 times in length of head; lips rather strongly developed, not extending across chin; two barbels on each side, the anterior very minute, the posterior about ½ diameter of eye. Dorsal III 9–10, equally distant from eye and from caudal, border feebly concave, last simple ray strong, bony, not serrated, ½ to ⅔ length of head. Anal III 5, not reaching caudal. Pectoral ½ to ⅗ length of head, not reaching ventral; latter below anterior soft rays of dorsal. Caudal peduncle nearly twice as long as deep. Scales finely striated longitudinally, $43\text{–}47\frac{6\frac{1}{2}-7\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$, 3 between lateral line and ventral, 16 round caudal peduncle. Silvery, back brownish, fins orange.

Three specimens, measuring 55 to 230 mm., from the Lucalla River at Lucalla.

This species also occupies an isolated position in the *B. bynni* division.

26. *Barbus mattozi*, Guimaraes.

Lucalla River.

Stands very near *B. argenteus*, Gthr.

27. *Barbus eutænia*, Blgr.

Quanza River at Dondo.

28. *Barbus kessleri*, Stdr.

Lucalla River and Lake Kilunda.

29. *Barbus holotænia*, Blgr.

Lucalla and Bengo Rivers.

30. *Barbus unitæniatus*, Stdr.

Lucalla and Bengo Rivers, Lake Kilunda.

31. *Barbus aurantiacus*, sp. n.

Depth of body equal to length of head, 3⅔ to 4 times in total length. Snout rounded, shorter than eye, which is 2⅔ to 2¾ times in length of head and equals interorbital width; mouth subinferior, its width 3½ times in length of head; lips moderately developed, interrupted on the chin; two minute barbels on each side. Dorsal III 8, equally distant from end of snout or anterior border of eye and from root of caudal, border slightly concave; last simple ray flexible, not enlarged, not serrated, as long as head. Anal III 5, not reaching caudal. Pectoral ¾ to ⅘ length of head, not reaching ventral; base of latter below anterior rays of dorsal. Caudal peduncle 1⅗ to 2 times as long as deep. Scales radiately striated, $26\text{–}28\frac{3\frac{1}{2}}{3\frac{1}{2}}$, 2–2½ between lateral line and ventral, 12 round caudal peduncle. Pale olive-brown above, each scale with a dark brown spot; a blackish streak on each side of the head, passing through the eye, continued as a series of spots along the lateral line; lower parts yellowish, more or less tinged with orange; basal half or two-thirds of fins bright orange.

Five specimens, measuring 54 to 87 mm., from the Lucalla River at Lucalla.

Most nearly related to *B. doggetti*, Blgr., from Lake Victoria; distinguished by the larger eye and fewer scales in the lateral line (26–28 instead of 29).

32. *Barbus musumbi*, sp. n.

Depth of body 2¾ to 3¼ times as long as deep, length of head 3 to 3⅔ times. Snout rounded, shorter than eye, which is 2½ to 3 times in length of head and equals interorbital width; mouth small, subinferior; lips feebly developed; two barbels on each side, posterior the longer and ⅓ to ½ diameter of eye; males with small nuptial tubercles on lips and sides of snout. Dorsal III 8, equally distant from eye and from root of caudal, border straight or slightly concave; last simple ray flexible, not enlarged, not serrated, as long as head. Anal III 5, not reaching caudal. Pectoral about ¾ length of head, not reaching ventral; latter below anterior rays of dorsal. Caudal peduncle 1⅓ to 1½ times as long as deep. Scales radiately striated, $22\text{–}25\frac{3\frac{1}{2}}{3\frac{1}{2}}$, 1½ between lateral line and ventral, 8 round caudal peduncle. Yellowish or pale olive above, scales often edged with black; top of head sometimes black; a more or less distinct black or blackish bar behind the gill-opening; fins red or blackish.

Total length 48 mm.

Numerous specimens from the Quanza River at Cambambe, the Bengo River at Cabiri, and Lake Kilunda.

Native name: Musumbi.

Very closely allied to the larger *B. congicus*, Blgr.

33. *Barilius ansorgii*, sp. n.

Depth of body equal to or a little less than length of head, 3⅔ to 4⅓ times in total length. Head 2 to 2⅓ times as long as broad, with feebly curved upper profile; snout pointed, not projecting beyond mouth, as long as or a little longer than eye, which is 3½ to 4 times in length of head; interorbital width 3 to 3⅓ times in length of head; mouth extending to below centre or posterior third of eye; no barbels; naked space between præoperculum and suborbitals not ½ width of third suborbital. Gill-rakers few, rudimentary. Dorsal II 7, originating midway between occiput and root of caudal, its posterior half above anal; anterior rays longest, ⅗ to ⅔ length of head. Anal III 12–14 (usually 13), anterior rays much longer than posterior, about as long as longest dorsals. Pectoral acutely pointed, as long as or a little shorter than head, reaching ventral or not. Caudal forked. Caudal peduncle 1⅔ to 2 times as long as deep. Scales radiately striated, $40\text{–}44\frac{7\frac{1}{2}-8\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$, 2–2½ between lateral line and ventral, 12–14 round caudal peduncle. Back bluish grey, sides and lower parts silvery white in females, bright yellow in males; 10 to 15 bluish-black vertical bars on each side, above the lateral line, the last usually expanding into a large blotch on the caudal peduncle at root of caudal; fins white.

Numerous specimens, measuring 80 to 120 mm., from the Quanza River at Dondo.

Closely allied to *B. kingsleyæ*, Blgr.

Siluridæ.

34. *Clarias gariepinus*, Burch.

Lake Kilunda.

35. *Eutropius ansorgii*, sp. n.

Depth of body 4 times in total length, length of head 5 times. Head 1⅓ times as long as broad; snout broad, a little longer than eye; both jaws equal in front; eye perfectly lateral, 5 times in length of head, 3 times in interorbital width; width of mouth equal to or a little less than interorbital width; vomero-palatine teeth forming an uninterrupted band, which is a little narrower than the band of præmaxillary teeth. Nasal barbel ½ to ⅔ length of head, maxillary ⅔ to ¾, outer mandibular ½, inner mandibular ⅕ to ¼. Gill-rakers moderately long, 9 to 12 on lower part of anterior arch. Dorsal I 6, entirely in advance of ventral, about twice as distant from caudal as from end of snout, its spine slender, ⅗ to ⅔ length of head, very feebly serrated behind. Anal 55–59. Pectoral not reaching ventral, its spine stronger and a little longer than that of dorsal, inner border feebly serrated. Caudal deeply forked, with pointed lobes. Caudal peduncle as long as deep or a little deeper than long. Brownish above, white below; a dark, ill-defined blotch on each side above the pectoral fin; vertical fins brownish, with a light streak along the anal.

Total length 240 mm.

Three specimens from the Quanza River at Cunga: one was caught in the act of swallowing a full-grown *Odaxothrissa ansorgii*.

Native name: Buanga.

The longer nasal barbel precludes the identification of this fish with the *E. bocagii*, from the Dondo River, described and figured by Guimaraes.

36. *Eutropius seraoi*, sp. n.

Depth of body 4 to 4½ times in total length, length of head 4⅔ to 5 times. Head 1¼ to 1⅓ times as long as broad; snout broad, as long as or a little longer than eye, projecting slightly beyond lower jaw; eye perfectly lateral, 3½ to 4 times in length of head, 2½ to 3 times in interorbital width; width of mouth equal to interorbital width; vomero-palatine teeth forming an uninterrupted band, which is narrower than the band of præmaxillary teeth. Nasal barbel ⅗ to ⅚ length of head, maxillary 1¼ to 1½, outer mandibular ¾ to 1, inner mandibular ½ to ⅔. Gill-rakers rather long and closely set, 15 to 18 on lower part of anterior arch. Dorsal I 6, entirely in advance of ventral, 2⅓ to 2½ times as distant from caudal as from end of snout, its spine slender, ⅔ to ¾ length of head, very feebly serrated behind. Anal 46–58. Pectoral reaching ventral or not, its spine stronger and a little longer than that of dorsal, inner border feebly serrated. Caudal deeply forked, with pointed lobes. Caudal peduncle as long as deep. Back brownish, sides and belly silvery white; a more or less distinct dark lateral stripe; a dark, ill-defined blotch on each side above the pectoral fin; fins whitish.

Ten specimens, measuring 50 to 200 mm., from the Bengo River and from the Lucalla River at Lucalla.

Distinguished from the preceding principally by the longer barbels and lower number of anal rays.

37. *Physailia ansorgii*, sp. n.

Depth of body 4½ times in total length, length of head 5 times. Snout broad, rounded, not projecting beyond mouth, a little shorter than eye; latter perfectly lateral, 3 times in length of head, and a little less than interocular width, which equals width of mouth. Nasal barbel ⅖ total length, maxillary and mandibular ½. Pectoral as long as head, extending beyond root of ventral, spine serrated on inner side. Ventrals very small, 2½ times as distant from caudal as from end of snout. Anal 60–65, narrowly separated from caudal, which is deeply forked, with pointed lobes. Yellowish, more or less dotted with black, especially on the back and anal fin; lateral line black.

Total length 63 mm.

Two specimens from the Quanza River at Cunga.

Intermediate between *P. pellucida*, Blgr., and *P. somalensis*, Vincig.; distinguished from the former by longer barbels, from the latter by the serrated pectoral spine.

38. *Chrysichthys acutirostris*, Gthr.

Quanza, Lucalla, and Bengo Rivers.

Native name: Msolo.

This species was only known from the single type specimen, obtained by Welwitsch at Golungo Alto.

39. *Chrysichthys bocagii*, sp. n.

Depth of body 4½ to 4⅔ times in total length, length of head 3½ times. Head moderately depressed, 1½ times as long as broad, its upper surface slightly rugose, covered with thin skin; occipital process narrow, extending to the small interneural shield; snout obtusely pointed; eye 3½ to 4 times in length of head, 1⅓ to 1½ times in interocular width; mouth inferior, its width 2½ times in length of head; præmaxillary band of teeth nearly straight, 3 times as long as broad; vomero-pterygoid teeth not much developed, forming a narrow band interrupted in the middle; nasal barbel 1 to 1⅓ diameters of eye, maxillary 1⅕ to 1¼ length of head, outer mandibular ⅔ to ¾, inner mandibular ⅖ to ½. Gill-rakers rather long, 15 to 17 on lower part of anterior arch. Dorsal I 6, $1\frac{1}{4}$ to $1\frac{1}{3}$ as distant from root of caudal as from end of snout; spine strong, feebly serrated behind, $\frac{3}{5}$ length of head; first and second soft rays longest, as long as head, reaching or nearly reaching adipose fin when folded; adipose fin as long as base of rayed dorsal, $\frac{1}{2}$ as long as its distance from latter. Anal 13, 9 rays branched. Pectoral shorter than head, spine strongly serrated on inner side. Caudal deeply forked, with long pointed lobes, middle rays $\frac{1}{3}$ length of longest. Caudal peduncle $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as deep. Olive-brown above, white beneath; fins olive-brown.

Two specimens, measuring 85 and 160 mm. respectively, from the Bengo River at Dondo.

Closely allied to *C. furcatus*, Gthr.; distinguished by longer barbels.

Named in memory of the late Prof. Barboza du Bocage, who so largely contributed to our knowledge of the Zoology of Angola.

40. *Chrysichthys ansorgii*, sp. n.

Depth of body $4\frac{1}{2}$ to 5 times in total length, length of head $3\frac{1}{4}$ to $3\frac{2}{3}$ times. Head rather strongly depressed, $1\frac{1}{5}$ to $1\frac{2}{5}$ times as long as broad, its upper surface smooth, covered with thick skin; occipital process narrow, extending to the small interneural shield; snout rounded; eye $3\frac{1}{2}$ (young) to 5 times in length of head, 1 (young) to 2 times in interocular width; mouth inferior, its width $1\frac{1}{3}$ to $1\frac{1}{2}$ times in length of head (narrower in young); præmaxillary band of teeth straight or feebly curved, 4 times as long as broad; vomero-pterygoid teeth forming a strong and long band, narrowly interrupted in the middle; nasal barbel as long as eye, maxillary $\frac{3}{4}$ to $\frac{5}{6}$ length of head (as long as head in very young), outer mandibular $\frac{1}{2}$ to $\frac{2}{3}$, inner mandibular $\frac{1}{3}$ to $\frac{1}{2}$. Gill-rakers rather long, 13–15 on lower part of anterior arch. Dorsal I 6, $1\frac{1}{4}$ to $1\frac{1}{2}$ times as distant from end of snout as from root of caudal; spine strong, feebly serrated behind, $\frac{2}{5}$ to $\frac{3}{4}$ length of head; second or third soft ray longest, $\frac{1}{2}$ to $\frac{3}{4}$ length of head; adipose fin as long as or a little shorter than base of rayed dorsal, $\frac{1}{3}$ to $\frac{1}{2}$ as long as its distance from latter. Anal 13, 8 or 9 rays branched. Pectoral much shorter than head, spine strongly serrated on inner side. Caudal moderately forked, the lobes obtusely pointed in the adult, middle rays $\frac{2}{5}$ to $\frac{1}{2}$ length of longest. Caudal peduncle $1\frac{1}{2}$ times as long as deep. Olive-brown or grey to blackish above, white beneath; fins olive-brown.

Numerous specimens, 65 to 300 mm. long, from the Quanza River at Dondo, and from the Bengo River.

In the adult and half-grown state this fish is easily distinguished from the preceding by the broader, flatter head, shorter maxillary barbels, and less deeply forked tail; but what I regard as the young of the two species are not so readily separated.

Cyprinodontidæ.

41. *Haplochilus macrurus*, Blgr.

Quanza River at Dondo.

Syngnathidæ.

42. *Syngnathus ansorgii*, sp. n.

Head and body ⅙ of total length; osseous rings 15+37, without spines; body a little deeper than broad; lateral line and upper caudal edge not continuous. Snout as long as postocular part of head; operculum crossed by a straight ridge; a ridge along the upper surface of the head and on the nape. Dorsal 29, originating above vent and occupying 7 rings. Anal 2. Pectoral and caudal fins well developed but small. Pouch half as long as tail. Yellowish brown, darker on the tail, with rather indistinct dark brown bars above and blackish spots dispersed regularly on the sides, one above and one below the median lateral ridge to each ring on the body; dark lines radiating from the pupil; caudal fin black, edged with yellowish above and beneath.

Total length 115 mm.

A single specimen from the Quanza River at Dondo.

Distinguished from *S. mossambicus*, Peters, and *S. kaupi*, Blkr., by more numerous dorsal rays, and from the latter by the shorter snout.

Native name: Ralo.

Mugilidæ.

43. *Mugil falcipinnis*, C. & V.

Bengo River at Cabiri.

Pleuronectidæ.

44. *Cynoglossus senegalensis*, C. & V.

Quanza River at Cunga.

Serranidæ.

45. *Lutjanus eutactus*, Blkr.

Quanza River at Cunga.

Pristipomatidæ.

46. *Pristipoma jubelini*, C. & V.

Quanza River at Cunga, and Bengo River at Quifungondo.
Native name: Matoma.

Cichlidæ.

47. *Hemichromis fasciatus*, Peters.

Quanza River at Cunga.

48. *Tilapia flavomarginata*, Blgr.

Quanza and Bengo Rivers, Lake Panguila.
Native name: Cacusso.

49. *Tilapia cabræ*, Blgr.

Quanza River at Cunga and Cabambe, Lake Rumango.
Native name: Shopa.

50. *Tilapia melanopleura*, A. Dum.

Quanza River at Cunga.

51. *Tilapia acuticeps*, Stdr.

Lucalla River at Lucalla.

Adult males are pale purplish brown, the chin and throat dull blue, the other fins yellow, dorsal, anal, and caudal with bright rose round spots and edged with light rose.

Gobiidæ.

52. *Nematogobius ansorgii*, g. & sp. n.

Depth of body 5 to 6 times in total length, length of head $3\frac{1}{3}$ to $3\frac{1}{2}$ times. Head $1\frac{2}{5}$ times as long as broad, broader than deep; snout short, rounded; jaws equal in front or lower slightly projecting; eye 4 times in length of head; interorbital space narrow; mouth extending to below centre of eye; no canines; head naked, with very regular series of sensory papillæ; a short nasal barbel and a pair of mental barbels. Dorsal VI, I 12; longest ray of first dorsal nearly ½ length of head. Anal I 9. Pectoral as long as head. Ventral with well-developed anterior membrane, not reaching vent. Caudal rounded. Caudal peduncle 1⅔ times as long as deep. Scales ctenoid, 37–40 in longitudinal series, 10–11 between dorsal and anal. Yellowish brown above, speckled with brown, with 3 or 4 ill-defined dark brown cross-bars; dorsal and caudal fins spotted with dark brown; a round blackish spot on upper part of pectoral fin, near its base.

Total length 80 mm.

Three specimens from the Bengo River at Cabiri.

Native name: Kimbunu.

In the presence of a nasal barbel and a pair of mentals this species differs from all the *Gobius* with barbels which are placed in the genera *Chæturichthys*, *Ainosus*, *Triænopogon*, &c., and deserves to be made the type of at least a subgenus, for which the name *Nematogobius* is proposed.

LXII.—*New Species of Heterocera from Costa Rica.*—III.

By W. Schaus, F.Z.S.

Lasiocampidæ.

Cluphe francesca, sp. n.

Body above lilacine buff; the anal hairs and subdorsal basal tuft brownish. Fore wings: the basal area above submedian, and the medial space above vein 3 light grey with two black points at end of cell; the costa finely, the inner margin and marginal space light fawn-brown; a white basal spot below cell; a curved geminate darker grey antemedial line with a paler spot on costa; the postmedial whitish buff below vein 5, incurved at vein 2, oblique and geminate from costa, angled at vein 7 and filled in with grey to vein 5, where it is followed by a brown streak between 5 and 6; a subterminal fine whitish lunular line; below vein 5 a fine paler line between subterminal and postmedial; a terminal paler line. Hind wings buff; the veins beyond a medial brownish shade slightly darker; the outer half of costa pale reddish brown crossed by a subterminal paler line.

Expanse 28 mm.

Hab. El Sitio.

Claphe cariosa, sp. n.

♂. Body brown, the tegula and patagia outwardly white. Fore wings: the inner margin below submedian, the outer margin and postmedial space below vein 4, also a spot on costa before apex light brown; the wing otherwise whitish grey irrorated with brown; a brown subbasal spot on costa; the antemedial and postmedial line broad, rather close together, meeting at submedian; the medial space below vein 3 more thickly irrorated with brown; the postmedial followed by white points on veins 5 to submedian; subterminal brown spots on whitish portion, shaded with white below vein 4. Hind wings brown; the costa and postmedial space beyond cell to subterminal white, thinly irrorated with brown; a medial dark brown line on costa.

Expanse 35 mm.

Hab. Tuis.

Closely allied to *C. vecina*, Schs.

Claphe laverna, sp. n.

♂. Palpi, head, collar, and patagia lilacine buff and brown. Thorax and subdorsal tuft at base of abdomen black and dark brown. Abdomen light reddish brown; anal hairs grey. Fore wings roseate buff, thickly irrorated with reddish scales; an irregular black antemedial line preceded by a fine reddish-brown line; a postmedial black line dentate to vein 4, then lunular, outwardly shaded with greyish brown, broadly between veins 7 and 9; a dentate grey-brown subterminal shade. Hind wings roseate buff on inner area; the costa broadly irrorated with reddish brown; a dark postmedial and marginal shade, the latter extending to anal angle.

Expanse 37 mm.

Hab. Banana River.

Allied to *C. deusta*, Wlk.

Claphe barda, sp. n.

Palpi buff, dark brown laterally at base. Head mottled buff and black. Collar and thorax black mottled with brown, the former with a broad grey streak outwardly from behind vertex. Abdomen brown, darkest subdorsally on two basal segments, followed by black and grey subdorsal scales. Fore wings: costal margin to postmedial and a space beyond cell whitish, the latter containing some black spots; below subcostal and vein 4 to postmedial the wing is mottled dark grey, black, and dark brown with a black streak near base of cell; traces of three oblique light brown lines on costa; postmedial brownish, geminate, the inner portion strongly marked with dark velvety brown from subcostal to near vein 4; the outer margin is broadly paler and browner with a very irregular blackish subterminal line, and crossed by dark brown veins; the fringe reddish brown with pale points. Hind wings: the costal half greyish white, with a grey geminate postmedial line and an interrupted subterminal line; the inner half of wing light brown. Underneath light brown; a subterminal dark shade on fore wings.

Expanse 38 mm.

Hab. La Florida, Sixola, Guapiles.

Allied to *C. vithersi*, Schs.

Claphe celebris, sp. n.

♂. Palpi brown. Head and collar grey, mottled with brown. Thorax brown; patagia blackish. Abdomen brown with a dark subdorsal tuft at base. Fore wings: the cell, costal margin, and above vein 7, and a short space beyond cell between veins 3 and 5, greyish black, crossed by black veins; inner and outer margins buff, thinly irrorated with darker scales; the antemedial line fine, wavy, black; the postmedial whitish on costa, then fine whitish buff, very indistinct, preceded below vein 3 by a lunular blackish line, and followed by short dark streaks on veins; the postmedial shade heavy, blackish, inset between veins 2 and 3, and 4 and 6; veins on light portion irrorated with dark brown; fringe grey-black spotted with buff. Hind wings light brown; the outer margin buff; a large blackish space at apex, and a similar subterminal shade.

Expanse 30 mm.

The female has the pale portion of fore wings thickly irrorated with reddish brown, the markings duller and more suffused. The hind wings are grey-brown, with buff marginal spots.

Expanse 43 mm.

Hab. Tuis, Juan Vinas, Sixola.

Claphe definita, sp. n.

♂. Head dark grey with two buff streaks. Collar and thorax dorsally dark grey, outwardly reddish brown, with a subdorsal buff streak. Abdomen dark brownish grey. Fore wings very dark violaceous brown; a reddish-brown spot at base; the medial space below cell, and the inner margin, light buff-brown; the antemedial line irregular, outcurved, interrupted, light buff-brown; the postmedial very fine, similar in colour, finely wavy, barely perceptible on costal half of wings, preceded by a darker line on pale portion of wing; three subterminal small white spots between veins 3 and 6, followed by fine white lunules; terminal buff spots on veins. Hind wings dark slaty grey; the costal margin dark violaceous brown; a faint pale medial line to inner margin above angle; terminal points less distinct; fringe brown, finely buff at base. The costal margin of hind wings is deeply excavated, then very oblique to vein 7.

Expanse 33 mm.

Hab. Juan Vinas; Nov. El Sitio, Sixola.

Claphe maria, sp. n.

♂. Head and thorax mottled buff and blackish scales. Abdomen brown, darkest subdorsally on two basal segments; some greyish scales terminally. Fore wings buff-brown, very thickly irrorated with black and brown to postmedial; traces of an antemedial line; a small black spot at end of cell; the postmedial dark brown, excurved, and oblique from costa, sharply curved around cell, lunular to inner margin, with white points on veins; the subterminal dark brown deeply lunular, dentate, followed by dark streaks on veins; fringe brown with pale spots at tips of veins. Hind wings brown; the costal margin to subterminal darkly irrorated like the fore wings; the subterminal dark, dentate at apex, then lunular, combining with the dark tips of veins to form round marginal spots. Underneath light brown, the subterminal line less distinct.

Expanse 43 mm.

Hab. Tuis, Sixola, Juan Vinas.

Allied closely to *C. theresa*, Schs.

Claphe elena, sp. n.

♂. Legs, head, and thorax whitish grey with some dark brown hairs. Abdomen light brown, terminally streaked with grey. Fore wings grey, the base tinged with whitish, the outer margin with pale brown, irrorated thinly with blackish scales, especially on medial space below cell; the antemedial blackish, dentate, outwardly curved, geminate from subcostal to vein 3, deeply indentate below vein 2; a black point in cell; the postmedial geminate, oblique from costa, finely dentate to vein 7, then incurved, lunular, and brownish to inner margin, with white points on veins, and inward black streaks on veins 2–5; a fine irregular subterminal brownish line; the outer margin with dark streaks on veins, those on 2, 3, and 5 extending within the subterminal; fringe light brown, with pale buff spots. Hind wings light brown; the costal margin broadly grey, with wavy dark postmedial lines; a subterminal dark line to anal angle; terminal dark streaks on veins. Underneath light brown, a subterminal dark line.

Expanse 42 mm.

Hab. Juan Vinas, Tuis.

Allied to *C. teresina*, Schs.

Claphe torrida, sp. n.

Body brown; tufts on legs, a streak on head, collar, and a subdorsal spot at base of abdomen dark violaceous brown. Fore wings reddish brown, tinged with paler reddish brown on costa and inner margin; the outer margin pale buff, inwardly curved from costa before apex to near end of cell, narrower near tornus, and irrorated with reddish brown below vein 4; a subterminal row of dark steel-grey spots, and some reddish brown on extreme margin; fringe light brown, darkly spotted from apex to vein 5, and below it with a dark line; some antemedial dark steel-grey spots, partly shaded with whitish scales; a broad dark steel-grey shade from end of cell to costa; a postmedial row of whitish spots on veins, faintly connected by a lunular dark shade. Hind wings reddish brown; the outer margin irregularly buff-brown; a similar medial line.

Expanse, ♂ 29 mm., ♀ 38 mm.

Hab. Juan Vinas; June. Tuis.

Allied to *C. pompilus*, Dogn.

Claphe nebula, sp. n.

♂. Head and thorax mottled dark brown and ochreous. Abdomen ochreous brown; a tuft of hairs similar to thorax subdorsally at base; anal hairs brown. Fore wings whitish grey, thinly irrorated with brown; the veins beyond postmedial dark brown; some brown at base; a geminate; irregularly curved antemedial line, olivaceous brown; a postmedial geminate line of the same colour, slightly curved below costa, and finely wavy to middle of inner margin, the outer portion of the line expanding into a broad shade below vein 6; submarginal angled dull greyish spots between veins 2 and 5, and 6 and 8; fringe olivaceous brown, with pale spots at tips of veins. Hind wings whitish, the veins terminally brown; a fine dark medial line; the inner margin broadly covered with ochreous hairs.

Expanse 33 mm.

♀. Body dark olivaceous brown, the last three segments of abdomen ochreous. Fore wings: the base olivaceous brown, the outer half of wing more of a dull dark smoky brown; the antemedial darker, geminate, excurved below costa, incurved below vein 2; a dark spot at end of cell, closely followed by the irregular postmedial, leaving the medial space very narrow; the medial space is dirty white; a similar curved shade from vein 6 to costa near apex, preceded by a dull brownish-grey subterminal shade, which curves outwardly below vein 6 and extends to tornus. Hind wings dark smoky grey; the costa with whitish shades and apical spots.

Expanse 47 mm.

Hab. Sitio, Sixola, Juan Vinas, Tuis, Cachi.

Claphe directa, sp. n.

♂. Head and thorax grey irrorated with ochreous hairs. Abdomen ochreous; anal hairs and a subdorsal basal patch dark grey. Fore wings: the base light grey limited by a dark antemedial line, angled on costa, indentate above submedian, joined on inner margin by an oblique line from base of cell; those lines are faintly geminate; some ochreous hairs at base of inner margin; the medial space white; the postmedial dark grey, geminate, nearly straight and slightly oblique; the outer space grey with a darker subterminal dentate shade, outwardly shaded with white especially towards apex; the veins all dark grey. Hind wings white; the inner area broadly ochreous; a dark medial line curved before inner margin; a subterminal grey shade at apex; fringe dark grey.

Expanse 36 mm.

Hab. Juan Vinas, Tuis, Sixola.

This species is closely allied to *C. lacinia*, Druce, which has, however, the medial white space narrower, the antemedial line rounded, not angled, and the subterminal grey shade on hind wings heavier and more extended.

Claphe larundina, sp. n.

♂. Head and collar buff-brown. Thorax shaded with dark brown. Abdomen light brown. Fore wings: the basal area dark brown with a small cluster of white scales above submedian, and limited by a geminate dark brown line, inwardly edged with light brown, only slightly curved from costa to inner margin; the rest of the wing greyish brown; some white on discocellular; the postmedial with white points on veins; a dentate, brown marginal shade. Hind wings light brown, the basal half of costa dark brown; the apex and outer margin tinged with grey. Underneath light brown; a dark medial line on costal half of hind wings.

Expanse 29 mm.

Hab. El Sitio, Juan Vinas.

Allied to *C. albidifascia*, Wlk., and *C. larunda*, Druce, which is wrongly numbered on the plate in the 'Biologia,' but browner in colour, and devoid of the white mottlings underneath.

Claphe poasia, sp. n.

♂. Head and collar greyish. Thorax mottled grey and dark brown. Abdomen light brown. Fore wings: the base light brown shaded with reddish brown above cell and at base of cell, limited by a slightly curved reddish-brown line, followed by a blackish-brown line; outer portion of wing grey irrorated with brown; a fine dark brown postmedial line almost straight, indentate on veins, followed by a brown shade, angled below costa, closer to it on inner than on costal margin; a wavy dentate subterminal dark grey shade. Hind wings light brown; the basal half of costa darker brown; the outer half and a part of outer margin whitish irrorated with grey.

Expanse 44 mm.

Hab. Volcano Poas, 7000 ft.

Allied to *C. larunda*, Druce, but much larger and quite distinct.

Claphe egra, sp. n.

♂. Palpi buff-brown, dark brown at base. Head and collar dark brownish grey. Thorax buff. Abdomen pale buff-brown, with subdorsal dark brownish-grey tufts on basal segments. Fore wings: the base pale buff with some brown shadings on costa, limited by a curved medial dark brown line, followed by buff and a blackish-brown line; postmedial space dark grey irrorated with white towards costa, containing a short dark streak on discocellular; this space outwardly irregular, followed by a dark buff shade divided by a fine brown line; subterminal space dark grey, outwardly edged above vein 2 by a still darker irregular shade; the outer margin brownish; fringe dark grey spotted with buff. Hind wings buff-brown; base of costa dark brown, limited by a dark medial line which crosses the wing; a subterminal grey shade wide at apex and at vein 3. Underneath brownish buff; heavy subterminal dark brown shades, and finer lines postmedially on costa.

Expanse, ♂ 33 mm.

♀. Head and thorax dull dark brown; an ochreous streak on patagia. Abdomen slightly paler brown. Fore wings dull dark smoky brown; the basal third ochreous, irrorated with a few dark brown scales, and outwardly crossed by a brown line, obliquely curved from costa to median, and again below cell; an irregular postmedial narrow ochreous shade crossed by a wavy brown line; an irregular subterminal blackish-grey shade. Hind wings: the costa broadly similar to fore wings with an ochreous space postmedially, irrorated with brown; the rest of the wing brown faintly tinged with lilacine.

Expanse 46 mm.

Hab. Juan Vinas, El Sitio.

This species is allied to *C. gera*, Schs., but larger and with much paler hind wings.

Claphe lepta, sp. n.

♂. Body and wings rich brown. Fore wings: basal half mottled with black chiefly in and below cell, and crossed by a fine irregular white line, incurved before a small pale spot at end of cell, and indentate below vein 2; this dark space is followed by a brownish-buff band, slightly curved below costa, and is separated from the brown outer space by a fine dark brown, geminate, postmedial line, with fine white points on some of the veins; a very faint dark subterminal line. Hind wings: the apex paler crossed by a dark subterminal line; a blackish-brown medial streak on costa. Underneath brown, the veins paler; a faint dark medial line on both wings.

Expanse 27 mm.

Hab. Sixola; Sept.

Claphe lanea, sp. n.

♂. Head, collar, and abdomen dull brown. Thorax and a subdorsal tuft at base of abdomen grey. Fore wings: the base white irrorated with black; the medial space clearer white; the outer half thickly irrorated with brown; an antemedial black line nearly straight from costa to vein 2, then inset and oblique to middle of inner margin; the postmedial dark brown, fine, forming three little outward curves below costa, between veins 3 and 5, and below vein 2; an irregular brown subterminal shade. Hind wings dull brown; the costal margin broadly, the outer margin to near anal angle narrowly grey; medial and subterminal dark lines.

Expanse 33 mm.

Hab. Juan Vinas.

Claphe capillata, sp. n.

Body and wings brown, the head, thorax, and fore wings tinged with lilacine. Fore wings: basal, geminate antemedial and postmedial line finely lunular, irregular, dark velvety brown; the postmedial followed by a row of dull brown spots, and both are outwardly shaded with greyish brown; two minute dark spots at end of cell; a subterminal row of dull brown spots faintly edged outwardly with greyish, and preceded by a slight similar shade at apex. Hind wings: a narrow terminal greyish line at apex.

Expanse 28 mm.

Hab. El Sitio; May. Juan Vinas, Cartago.

Claphe lankesteri, sp. n.

♂. Body above and legs mouldy grey, underneath brownish buff. Fore wings buff, thickly irrorated with dark brown; inner margin and outer margin below vein 4 mouldy grey, edged above on basal half by a whitish shade, and inwardly from outer margin and along vein 4 by a dark greyish-brown shade almost broken into spots; a subterminal row of small brown spots above vein 4, coalescent and edged with clear buff. Hind wings light brown; a greyish streak along inner margin; a faint darker medial shade; a subterminal and terminal buff line; some greyish spots on fringe. Underneath buff, with brownish streaks on costa and towards apices.

Expanse 37 mm.

Hab. Juan Vinas; June.

This species, which I have named after Mr. C. H. Lankester of Cachi, is closely allied to *C. marna*, Schs., from Southern Brazil.

Claphe carola, sp. n.

♂. Body and wings brown. Fore wings: an antemedial darker line spotted with white; a dark discal linear spot hardly visible; the postmedial finely wavy, darker brown spotted with white, followed by a faint lilacine shade near costa; the subterminal darker, remote from margin, not reaching inner margin. Hind wings with the fringe slightly darker.

Expanse 33 mm.

Hab. Sixola; March, Sept.

Claphe sigurda, sp. n.

Head and abdomen lilacine brown. Thorax dull reddish brown. Fore wings dull reddish brown, the lines buff; the antemedial line straight; the discal spot thick, linear, blackish; the postmedial line angled below costa and slightly oblique to inner margin, followed by a fine more oblique line from above vein 5 towards apex; a fine lunular outwardly curved subterminal line from vein 6 to inner margin near tornus. Hind wings lilacine brown, the costal margin dull reddish brown; a faint pale outer line incurved at cell, the costal margin of hind wings is nearly straight, then oblique to below vein 7, beyond which it is rounded.

Expanse 28 mm.

Hab. Sixola; March. Peralta.

Claphe sobrina, sp. n.

♂. Body brown; some darker brown on head, posteriorly on collar, and subdorsally on thorax and abdomen at base. Wings light brown. Fore wings thinly irrorated with darker brown; a blackish line at base; an outwardly curved brown-black antemedial shade; an oblique similar medial shade on costa to discal spot; the postmedial fine, dark, angled below costa, and followed on costa by a small buff spot, inwardly oblique to vein 5, then wavy to inner margin, followed by a less distinct and finer shade; a subterminal row of dark spots between the veins; fringe dark grey, spotted with buff-brown. Hind wings light brown, mottled with darker brown on costal margin; a faint geminate dark shade from costa to inner margin; a faint buff subterminal line; fringe as on fore wings.

Expanse, ♂ 26 mm.

The female is darker, the antemedial shades more suffused, the postmedial straighter with buff points on veins.

Expanse, ♀ 33 mm.

Hab. Juan Vinas, Sixola, Tuis, Cartago.

Claphe yoha, sp. n.

Head and thorax mottled brown, lilacine grey, and black. Abdomen brown. Fore wings: the basal half brown, the costa and veins black, and some black basally below cell; the inner margin at base clearer lilacine brown, limited by a wavy black line, closely followed by a white spot at end of cell; the outer portion of wing lilacine grey thickly irrorated with light brown; the postmedial line very faint, dark, incurved beyond cell and with white points on veins; the subterminal line broken, very faint and indistinct. Hind wings: the costal margin brown shaded with black, limited by a paler line; the basal area below cell to near tornus brown; the outer margin broadly similar to fore wings. Underneath light brown; a blackish medial line on costal margin of hind wings.

Expanse 30 mm.

Hab. Sixola; Sept. Guapiles.

Claphe sonia, sp. n.

♂. Head and thorax brown irrorated with buff scales. Abdomen brown, with a darker subdorsal tuft at base. Fore wings brown irrorated with buff, and darkest on medial space and outer margin; small whitish basal spots; dark subbasal spots on costa and inner margin; the antemedial wavy, dark brown, inwardly edged with whitish; an irregular black spot at end of cell; the postmedial finely dentate, curved around cell, partly edged outwardly with white, and followed by a lunular buff outer line; a buff streak between veins 4 and 5; subterminal dark brown spots, outwardly edged by curved buff lines, and preceded between veins 5 and 7 by lilacine white patches, and above vein 7 by a dark streak; fringe brown and buff. Hind wings brown, the costal margin mottled with grey and spotted with darker brown; a short whitish subterminal line at apex. The costal margin of hind wings short, slightly excavated, then oblique to vein 6, beyond which it is rounded.

Expanse 28 mm.

Hab. Sixola; Sept. Juan Vinas, La Florida.

Claphe dormia, sp. n.

♂. Body reddish brown, with some darker mottlings on collar and thorax. Fore wings: the base, cell, and costa to postmedial, a shade from cell to outer margin, and a broad streak on costa before apex olivaceous brown, otherwise whitish grey, irrorated with darker scales; an antemedial and a postmedial row of whitish spots on veins, connected by a fine dark line; a subterminal irregular row of small dark spots; a black spot at end of cell. Hind wings light brown; the costal margin darker, and with broad medial and postmedial shades; a subterminal series of dark spots not reaching anal angle. Underneath light brown, with traces of dark subterminal spots.

Expanse 29 mm.

Hab. Juan Vinas; June. Sixola, Guapiles, Tuis.

Claphe canities, sp. n.

♂. Body olivaceous brown. Fore wings: the base to discal spot whitish, irrorated with yellowish and olivaceous brown scales to antemedial, which is fine, geminate, dark, nearly straight; discal spot dark, linear; the outer portion of wing olivaceous brown, with a nearly straight darker line just beyond discal spot, followed by a broader irregular dark shade; the subterminal dark shade very broad, outwardly curved at apex. Hind wings: the costal half whitish, irrorated with olivaceous brown, otherwise olivaceous brown; a medial dark shade, and a broad subterminal darker shade.

Expanse 36 mm.

Hab. Juan Vinas; Nov., Jan.

Claphe phyllis, sp. n.

♂. Body dark brown, shaded with black on thorax. Fore wings light brown; the costal half from base at submedian to postmedial blackish, crossed by a broad light brown line, and some antemedial white points; the postmedial which is coalescent with the black portion has white points on the veins; a subterminal row of black spots, oblique, coalescing on costal margin, followed by another black spot at apex of costa. Hind wings duller brown; the costal margin suffused with black; medial and submedial dark brown lines, edged with grey on black portion. Underneath light brown; fore wings with postmedial geminate line crossed by faint buff lines on veins; subapical black spots; hind wings with a similar postmedial line, though rather darker, also an interrupted dark subterminal shade.

Expanse 30 mm.

Hab. Tuis; Aug.

Claphe attenuata, sp. n.

Body light brown, the thorax and patagia posteriorly darker. Fore wings dark brown; a small brown spot below cell near base; a geminate antemedial fine dark line shaded with grey; a round velvety-black spot at end of cell; a postmedial dark line very fine, except on costa where it is curved and oblique, slightly outcurved at vein 4, followed by a buff shade; beyond the space is lighter brown crossed by a broad subterminal grey shade on which is a series of blackish-brown spots and is preceded on costa by a dark brown shade. Hind wings dark brown; a whitish streak on costa near apex.

Expanse 21 mm.

Hab. Sixola.

A specimen from Guapiles is lighter brown, with the round discal spot.

Specimens from Juan Vinas are still paler with all the markings reduced, and the discal spot consisting of a dark streak.

Claphe jeba, sp. n.

♂. Body reddish brown; the patagia with dark streaks. Fore wings brown, heavily shaded with black and brown-black at base, basally between veins 2 and 3, in cell, and between veins 5 and 9 to subterminal; an antemedial and a medial brown line on costa; the postmedial geminate, very oblique from costa, curved, interrupted between 5 and 6 by a small pale spot, then very oblique inwardly, and wavy to inner margin; a light brown postmedial space between 3 and 5; a subterminal lunular blackish shade, edged with lilacine grey, broadly so at apex. Hind wings brown; the outer margin shaded with black, on which is a subterminal white line, most noticeable at apex.

Expanse 23 mm.

The female has the black shading of fore wings less pronounced, more smoky; the hind wings blackish brown.

Expanse 30 mm.

Allied to *C. libnites*, Druce, and *C. marginata*, Schs., but very much darker.

Claphe indentata, sp. n.

♂. Body light brown; darker subdorsal tufts on abdomen. Wings light buff-brown. Fore wings: a whitish antemedial spot, and below it a dark brown streak from base extending to middle of wing along vein 2; a dark geminate antemedial line from costa to vein 2; the outer portion of cell and space between veins 2 and 6 to postmedial lilacine brown, with still darker irrorations between 5 and 6 beyond cell; the postmedial dark brown, much incurved at vein 2 to meet dark line, followed closely by a lunular dark line and shade, both obsolescent between 5 and 6; the subterminal space whitish, crossed by a grey shade; the extreme margin shaded with brown; a dark line at base of fringe, interrupted at veins. Hind wings: a subterminal curved grey shade.

Expanse 26 mm.

Hab. Juan Vinas.

Also allied to *C. libnites*, Druce, and *C. marginata*, Schs.

Besides the above new species, the following species of *Claphe* were also found in Costa Rica:—*phedonia*, Stoll, *charax*, Druce, *laronia*, Druce, *amathuria*, Druce, *zurcheri*, Druce, *thyatira*, Druce, *limba*, Druce, *larunda*, Druce, *lacinia*, Druce, *albidifascia*, Walk., *albigrisea*, Schs., *modesta*, Druce, *gera*, Schs., *marginata*, Schs., *guttularis*, Walk., *praxithea*, Druce, *melancholica*, Btl., *vitripuncta*, Schs., *obliterata*, Schs., *rundala*, Schs., *consolabilis*, Dyar, *deusta*, H.-S., *libnites*, Druce, *submarginalis*, Walk.

Notodontidæ.

Nystalea guzmani, sp. n.

Palpi light grey in front, tipped with brown. Frons and collar dull greyish black; vertex shaded with buff. Thorax brown; a whitish patch anteriorly on patagia. Abdomen dark fuscous above, whitish buff underneath. Fore wings olivaceous brown, a small black spot at base of cell, followed by some fine, indistinct, wavy, dark transverse lines; an antemedial whitish patch in cell and a streak above it on costa; a faint lunular, geminate, medial line, followed by a dark brown oblique streak from costa to just below vein 2, and a finer similar line; spot at end of cell large, irregular, outlined in white, preceded and followed by a little white; a postmedial line and dark streaks, interrupted by some white scales beyond cell, curved from costa to submedian vein; from postmedial to apex a broad white shade and some white points on veins 2–4; a short black streak between veins 7 and 8 on white space; a fine, irregular, dark marginal line. Hind wings fuscous, slightly whitish at base. Underneath: fore wings dark grey; costal margin white, with dark spots towards apex; the outer margin shaded with grey and a marginal dark line. Hind wings whitish; a broad dark grey submarginal shade.

Expanse, ♂ 53, ♀ 56 mm.

Hab. Juan Vinas.

Nystalea striata, sp. n.

Palpi buff, streaked with dark reddish brown. Head and thorax reddish brown, shaded with buff anteriorly. Abdomen above dull dark brown; an ochreous shade subdorsally at base and a subdorsal pale line. Fore wings dark violaceous brown, somewhat silky and thinly irrorated with lilacine scales; the inner margin narrowly light reddish brown; duller brown streaks between the veins; darker transverse lines in sets of three, wavy; the basal lines only on costa, the antemedial on costal margin and between vein 2 and submedian, the postmedial on costal margin and between vein 3 and submedian, though otherwise faintly visible; a faint irregular brown spot at end of cell; a long spot on costa at apex above vein 7, light brown streaked with reddish, and with buff along 7; small, marginal, paired, dark brown spots between veins. Hind wings fuscous, somewhat whitish at base.

Expanse, ♂ 58, ♀ 56 mm.

Hab. Juan Vinas, Port Limon.

Nystalea discalis, sp. n.

♂. Head and collar rufous, with paler lines and darker patches on collar. Thorax similar, the patagiæ grey irrorated with brown. Abdomen dull brown; buff lateral patches at base; anal segment rufous. Fore wings light grey; the inner margin shaded with brownish grey; the veins spotted with black, except on medial space and towards apex; a faint basal and three fine subbasal lines; three antemedial lines, most heavily marked above and below cell, and shaded with rufous brown; at end of cell an almost triangular black line, with a short black line projecting towards base; a faint postmedial grey line, followed by three rows of grey transverse streaks between the veins, heaviest between veins 2 and 4; a subterminal rufous-brown shade from vein 7 to inner margin; marginal black spots preceded by smaller paired spots between the veins; fringe grey, with brown spots between veins. Hind wings fuscous, the base and discal area somewhat whitish; the veins dark; the fringe pale buff. Underneath: the fore wings are brown, shaded with reddish subterminally; a buff streak below costa; the outer margin greyish, with the veins buff. The hind wings whitish; the veins and outer margin fuscous; the costal margin broadly rufous brown; buff terminal shades, especially at apex.

Expanse 60 mm.
Hab. Juan Vinas.
Allied to *N. nyseus*, Cr., and *guttulata*, Schs.

Nystalea nyseus collaris, subsp. n.

♂. Differs from *N. nyseus*, Cr., in having the head and collar dark velvety brown, almost black.
Expanse 57 mm.
Hab. Juan Vinas; June.

Pentobesa placida, sp. n.

Palpi and frons dark brown and buff. Vertex, collar, thorax, and abdomen buff-grey, the latter with transverse darker bands. Fore wings greyish buff, irrorated with violaceous-brown scales, especially in cell and along costal margin; a dark streak on inner margin from base to postmedial; a dark streak on discocellular; the postmedial punctiform, indistinct; indistinct paired brown streaks between veins from cell to outer margin; a terminal row of darker spots, preceded by fine dark lunular lines, very indistinct; an oblique subterminal dark line above vein 3. Hind wings whitish, the outer margin narrowly fuscous.
Expanse, ♂ 36 mm.
The female is darker and more distinctly marked, the hind wings more smoky white.
Expanse 43 mm.
Hab. Juan Vinas, Guapiles, Tuis.

Marthula rufescens, sp. n.

♂. Palpi, head, and collar brown. Thorax deep velvety reddish brown, the patagiæ lilacine. Abdomen above dull grey-brown, sublateral black tufts on last two segments. Fore wings brown shaded with lilacine at base, on inner margin, medially in and below cell, and on outer margin below vein 3; costal margin medially broadly shaded with reddish; lines shaded with lilacine; the subbasal inset on costa, geminate from median to submedian; the antemedial and postmedial geminate, hardly visible on costa; the subterminal nearly straight; a large linear spot at end of cell; marginal dark spots between the veins. Hind wings brown.
Expanse, ♂ 35 mm.
♀. The collar dark brown. The wings more uniformly lilacine brown; no reddish shade on costa. Hind wings fuscous brown. Underneath: the fore wings are brown, the

outer margin broadly greyish; the costal margin narrowly shaded with buff.

Expanse 40 mm.

Hab. Sixola, Juan Vinas, El Sitio.

Eragisa barnesi, sp. n.

Palpi, head, and thorax pale olivaceous shaded with brown. Abdomen above brown, the last two segments olivaceous grey; underneath ochreous. Fore wings light olivaceous shaded with darker olive; from base of costa a roseate brown line, irregularly oblique and edged with dark olivaceous to inner margin and also to costa, connected by a straighter fine dark line; an antemedial, fine, lunular, olivaceous line, followed by a roseate brown band edged with dark brown, slightly oblique and dentate on inner margin; an irregular linear spot at end of cell, and above it a dark oblique line from costa joining a dentate dark olivaceous line from costa to inner margin, which is followed by a roseate brown band, straight from costa to inner margin near tornus; this is partly shaded with white, outwardly edged with dark brown, and closely followed by another dentate dark olivaceous line; a marginal dark shade emitting streaks on veins, and heaviest between veins 4 and 5; a terminal brown line, interrupted by the veins, outwardly edged with white and followed by dark olivaceous spots. Hind wings dark brown; some yellowish hairs at base; the outer margin finely and fringe pale yellow; traces of a dark medial line angled above anal angle, where it is darker, and edged below with a small whitish spot and dark point. Underneath violaceous brown, the base ochreous, the outer margins yellowish.

Expanse, ♂ 57, ♀ 65 mm.

Hab. Juan Vinas, Tuis, El Sitio, Guapiles, Sixola.

Named after Mr. J. Barnes, who assisted me in my discoveries.

Eragisa juvenis, sp. n.

Palpi dark velvety brown, streaked in front with grey; third joint also grey. Head and thorax grey. Abdomen above fuscous; a subdorsal white line; last segments whitish grey. Fore wings grey-white, thinly irrorated with dark scales; a dentate, fine, dark, antemedial line, outwardly oblique from costa to middle of inner margin, with an ochreous point on subcostal; a small white spot at end of cell; a postmedial dark spot on costa, followed by a fine dark line, incurved beyond cell, indentate on vein 2, outwardly edged in places with bright yellow; a marginal dark line, interrupted by the veins, straight from apex to vein 3, then wavy. Hind wings brown; the fringe white. Underneath fuscous shaded with white on extreme margins.

Expanse 48 mm.

Hab. Sixola.

Eragisa nox, sp. n.

♂. Head, thorax, and last segments of abdomen above blue-black; abdomen otherwise dark brown, with dark subdorsal tufts basally, and some ochreous shadings at base underneath. Fore wings blue-black; small brownish spots along costa; a faint antemedial line, outwardly oblique from costa across cell; a vague discal spot partly outlined with light brown; some postmedial velvety points between veins, the largest between 2 and 4, followed by a fine geminate line barely discernible; a very faint subterminal dull shade; small marginal dark velvety-brown spots inwardly shaded with lighter brown; a terminal dark brown line, with faint brown points on fringe at tips of veins. Hind wings dark brown; some luteous hairs at base and on inner margin; a dark spot at angle cut by a pale line. Underneath dull dark brown; light brown spots on outer half of costa of fore wings; the base of hind wings below costa ochreous.

Expanse, ♂ 62 mm.

The female more of a dull dark brown; the discal spot ochreous; the postmedial with white points on veins; the subterminal more distinct, tinged with buff. Hind wings with the fringe pale ochreous. Underneath the outer margins are narrowly yellowish buff.

Expanse 64 mm.

Hab. Juan Vinas, Guapiles.

Farigia albicans, sp. n.

♂. Body above mottled brown and white, producing a greenish effect. Fore wings white thinly irrorated with brown; some brown and green at base below cell; the inner margin narrowly light green; a fine greyish geminate line from middle of costa, inwardly oblique to below cell, then wavy; a black point at end of cell, closely followed by a fine greyish curved line to middle of inner margin; the postmedial fine, dark, geminate filled in with light green, which extends slightly beyond it; a grey-brown shade on costa beyond postmedial; a shade between veins 3 and 4 and a broad terminal similar shade between 4 and 6; a dark marginal line oblique subapically, nearly straight from 6 to 4, then inset in interspaces below; fringe grey-brown spotted with white. Hind wings light brown; the fringe terminally white. Underneath dirty white; the costa of fore wings broadly shaded with brown; the outer margin irrorated with brown.

Expanse, ♂ 40 mm.

The female is more heavily irrorated with grey, the lines rather coarser. Underneath both wings are thickly irrorated with brown.

Expanse, ♀ 53 mm.

Hab. Juan Vinas.

Farigia foliata, sp. n.

♂. Palpi whitish in front, dark brown laterally. Head, collar, and thorax whitish mottled with brown. Abdomen above dark brown irrorated with grey. Fore wings green; the lines and veins on outer margin dark brown; basal third of costal margin to just below cell whitish irrorated with brown, crossed by a dentate basal line and limited by a geminate line inwardly oblique from costa to median vein, then inset and wavy to inner margin; the postmedial wavy, geminate, excurved and very indistinct, followed by a dark shade below costa, on vein 6, and between veins 3 and 4; a lunular marginal line; fringe dark brown. Hind wings dull dark brown, the fringe terminally whitish. Underneath brown; a smoky shade on disk of fore wings and a broad medial darker brown shade on hind wings.

Expanse, ♂ 44 mm.

The female has the basal white patch suffused with grey and brown, so that it is almost obliterated.

Expanse 56 mm.

Hab. Juan Vinas, El Sitio, Tuis.

Farigia tulana, sp. n.

♂. Palpi brown, irrorated with white in front. Head, collar, and thorax white, with a few brown hairs. Abdomen above brown, the terminal segments irrorated with grey. Fore wings: the base brownish, followed by a large white patch on costal margin and cell, extending slightly below it, limited by a curved dark brown line, heavily marked just below cell, and partly geminate; the inner margin broadly shaded with light green and mottled with brown scales; above vein 2 and outwardly the wing is greyish brown, with a darker patch at end and just beyond end of cell, also irrorated with green; the postmedial is dark brown, lunular, barely curved, most heavily marked below vein 2; a marginal dark line broken by veins. Hind wings light brown, with a terminal darker shade. Underneath whitish brown, with dark brown hairs on outer half of costa of hind wings.

Expanse, ♂ 32 mm.

The female has the outer margin beyond postmedial whitish grey.

Expanse, ♀ 44 mm.

Farigia moresca, sp. n.

Palpi buffish in front, dark brown behind. Head, collar, thorax, and subdorsal tufts on abdomen dark reddish brown, mottled with white hairs. Abdomen above reddish brown irrorated with grey, underneath luteous. Fore wings dull brown-grey shaded with green at base, along inner and outer margin, and on antemedial and postmedial lines, which are geminate, blackish, and rather ill-defined; a subbasal dark spot below cell; a dark shade between veins 3 and 4 and a dark costal patch beyond postmedial, all irrorated with green; a brown spot at end of cell; a marginal irregular black line, very marked; fringe dark brown, with buff spots at end of veins. Hind wings dark brown; the fringe terminally whitish spotted with white. Underneath brown, the spots on fringe more distinct.

Expanse, ♂ 43, ♀ 52 mm.

Hab. Juan Viuas, Guapiles, Sixola, Tuis.

Eustema sericea, sp. n.

♂. Legs and head black-grey. Thorax and abdomen rufous brown, the latter with transverse ochreous lines posteriorly on segments. Wings silky grey, the veins somewhat darker. Fore wings: a faint postmedial dark grey shade slightly curved below costa. Hind wings: some brownish hairs on inner margin.

Expanse 57 mm.

Hab. El Sitio, Juan Vinas, Tuis.

Allied to *Eustemides carama*, Druce, in appearance, but belonging to genus *Eustema*.

Heterocampa mullinsi, sp. n.

♂. Palpi buff, outwardly shaded with green. Head green, with black shadings on vertex. Collar green, with white scales posteriorly. Thorax brown; patagia green. Abdomen brown above, with subdorsal green tufts, large on second segment; last two segments paler; ventrally whitish. Fore wings dark green; a large brown space from end of cell, not reaching costa, extending to vein 2, and limited by a subterminal darker brown irregular and angular shade, crossed by the brown discocellular streak, and a geminate postmedial lunular line; some fine black basal lines; at a third from base on costa a deeply dentate, geminate, dark line to middle of inner margin; a broad dark brown streak on basal half of inner margin; the subterminal preceded on inner margin by a short white streak; an interrupted terminal black streak; dark spots on fringe at ends of veins. Hind wings white; the costa broadly brown, crossed by a dark postmedial shade and a pale subterminal line; the inner margin tinged broadly with dark buff; a terminal dark line; fringe buff, green at apex.

Expanse 46 mm.

♀. The outer margin of hind wings fuscous.

Expanse 60 mm.

Hab. Juan Vinas, Tuis, Sixola.

This fine species is named after Mr. W. E. Mullins, manager of the northern railway of Costa Rica, to whom I am greatly indebted for innumerable kindnesses.

Heterocampa editha, sp. n.

Legs reddish brown and buff, streaked in front with dark brown and green; fore coxæ steel-grey. Palpi green in front, dark reddish brown behind and laterally. Head greenish. Collar and thorax brown, the patagia shaded with green. Abdomen light reddish brown above, a large blackish subdorsal tuft at base. Fore wings pale green; the basal third dark violaceous brown, mottled with green and black, limited by a reddish-brown line, slightly oblique outwardly from costa, and closely followed by an irregular fine darker line; a fine, dark, dentate medial shade, interrupted by an irregular pale buff spot at end of cell, containing two dark points on discocellular; a postmedial, reddish-brown, lunular, partly geminate line; an oblique greyish shade from below end of cell to outer margin just above tornus; a dark shade on costa from postmedial to near apex, with four pale points; a subterminal fine shade, dark near costa, interrupted below vein 4, consisting of two dark spots above submedian, and followed by a dark grey-black shade above vein 4; a marginal brown shade. Hind wings yellowish white, the veins and margins shaded with light reddish brown; a faint postmedial line and some darker scales on inner margin near angle.

Expanse 44 mm.

The female has the line on hind wings more distinct and the outer margin broadly light reddish brown.

Expanse 59 mm.

Hab. Juan Vinas, El Sitio, Tuis.

Heterocampa vivida, sp. n.

Palpi light brown, a dark streak behind. Head green. Tegula and patagia green, partly edged with buff-brown. Thorax brown. Abdomen above greyish brown. Fore wings rich green; the lines brown, partly shaded with buff and dark brown; a curved basal line and streak on base of inner margin; the antemedial very dentate; the postmedial lunular, oblique from costa, then nearly straight to inner margin; a large whitish spot at end of cell, crossed by dark discocellular; subterminal brown spots, broadly shaded with whitish, basally dentate towards costa; terminal white points; fringe brownish, with darker spots. Hind wings whitish, the veins dark; the costal margin green, crossed by a whitish line near apex, which continues as a faint greyish postmedial line; the outer margin irrorated with dark grey, which spreads over nearly the entire wing in the female; fringe buff, with dark points.

Expanse, ♂ 46, ♀ 53 mm.

Hab. El Sitio, Tuis, Juan Vinas.

Heterocampa hemicera, sp. n.

♂. Head and thorax lilacine brown; the patagia tipped with grey. Abdomen above dark dull brown, the anal segment and tufts greyish fawn. Fore wings fawn-colour; the costal margin shaded with lilacine; the outer margin below vein 4 shaded with grey, and a similar shade at base below cell; a lilacine grey shade from postmedial to apex; a fine dark streak along median; two dark points on discocellular, the lower one edged with white; a basal geminate inner and an outer oblique brownish shade on costa, the commencement of lines, the outer line curving around end of cell and faintly visible to inner margin; a faint geminate postmedial line, punctiform on veins; from vein 2 a dark reddish-brown shade to apex extending to outer margin above vein 4; on this dark shade the veins are blackish; fringe fawn-colour. Hind wings dull dark brown, the fringe luteous.

Expanse, ♂ 40, ♀ 45 mm.

In the female the dark shade from vein to apex is somewhat suffused with violaceous black.

Hab. Juan Vinas, Sixola, Tuis, Guapiles.

Rifargia nebulosa, sp. n.

♂. Body grey above, white underneath; a reddish-brown shade posteriorly on collar. Fore wings grey, palest in discal area and thinly irrorated with brown; a black basal line, angled on subcostal, followed by a brown spot on costal margin; a fine dark geminate antemedial line, wavy, indentate on submedian; a large, linear, irregularly lunular spot at end of cell; the postmedial geminate, lunular, dark brown, curved beyond cell, followed by broad brown shadings, especially towards costa and apex; a dark marginal wavy line and dark brown streaks on veins beyond postmedial. Hind wings white; a dark grey shade on inner margin; the outer margin narrowly grey. Underneath white; dark streaks on veins towards apex of fore wings.

Expanse, ♂ 36 mm.

♀. More uniformly grey, with brown costal spot near base; the subapical shadings more reddish brown; the hind wings more greyish, with the veins on outer margin more heavily marked with grey.

Expanse 41 mm.

Hab. Avangarez.

Another female from the same locality has both wings smoky grey; the fore wings darker, with faint traces of the discal spot and subterminal brown shadings; the marginal line is alone distinct.

Expanse 44 mm.

A female from Tuis has the body above and fore wings black, some white at base of antennæ; the end of cell and space beyond to subterminal shade white, from veins 2–7 crossed by a blackish shade in end of cell and between 4 and 6; the hind wings are white, the veins terminally and margins narrowly black.

Expanse 44 mm.

This last form may be a distinct species, for which I propose the name of *medioclara*.

R. nebulosa is allied to *R. felderi*, Schs., and *R. bichorda*, Hamps.

Naprepa flexifera, sp. n.

Head and thorax dark violaceous brown, irrorated with black and buffish-grey scales, the latter on tips of thoracic tufts. Abdomen above brown; a dark subdorsal spot at base. Fore wings brown tinged with violaceous, somewhat paler on inner margin; a very deeply dentate inner line, fine, black, inwardly shaded with lighter brown in cell, and outwardly so shaded below cell; a large irregular spot at end of cell finely outlined with whitish buff; a somewhat similar outer line crossed by a dark wavy postmedial shade curved around cell; on outer angles of outer line clusters of black and light brown scales, connected by a wavy light brown shade, and a white line above submedian; a dark shade between 3 and 4; a wavily dentate light brown line, partly shaded outwardly with dark brown; terminal diverging black streaks at ends of veins. Hind wings brown; some light brown shadings at anal angle surmounted by a white and a black streak; a terminal black line, cut by the veins, which are buff at their tips; fringe light brown. Underneath the abdomen and wings are buff, irrorated with brown except on discal area of fore wings, which is light fuscous without irrorations.

Expanse, ♂ 98, ♀ 108 mm.

This species is very close to *Naprepa houla*, Dyar, and I should hardly have considered it distinct had a specimen not been labelled by him as new.

PROCOLAX, gen. nov.

Differs from *Colax*, Hübn., in having vein 10 on fore wings from beyond 7, and the female has the antennæ fasciculate.

Procolax apulana, sp. n.

♂. Head and abdomen above grey-black; collar dark grey-brown. Thorax lilacine buff, the patagia reddish brown. Abdomen underneath brownish. Fore wings reddish brown, the veins partly black; the costal margin dark brown and black irrorated with buff scales; the lines dark brown; the basal nearly straight, followed by a broad dark shade; the antemedial slightly excurved; the postmedial nearly straight, somewhat lunular below vein 4; a medial dark shade from costa, widening on inner margin; the inner margin narrowly shaded with lilacine; a long silver streak on discocellular containing a reddish-brown streak; a small silver spot in cell medially below subcostal; a subterminal lilacine shade, somewhat incurved below vein 4 to tornus, beyond which the outer margin is shaded with lilacine and dark grey, the latter forming terminal blotches irregularly defined by a fine whitish line, edged with silver at apex; vein 4 beyond postmedial rather heavily shaded with black. Hind wings soiled white, thinly scaled; the costal and inner margins broadly fuscous, the outer margin narrowly so.

Expanse, ♂ 77, ♀ 94 mm.

Some specimens are considerably smaller.

Hab. Juan Vinas, Tuis.

LXIII.—*Rhynchotal Notes.*—LII. By W. L. DISTANT.

Australasian Pentatomidæ (concluded from p. 481).

MYAPPENA, gen. nov.

Head about as long as broad between eyes, the lateral lobes considerably divergently spinously produced in front of the apex of the central lobe, the lateral lobes are also longly longitudinally produced from near their base to the base of the first joint of the antennæ; ocelli near eyes; antenniferous tubercles prominently spinous externally; antennæ four-jointed, first joint stoutest, sparingly strongly hirsute, longly produced in front of head, second joint about twice as long as first, third and fourth subequal, each much shorter than second; pronotum about half as long as breadth between the lateral angles, the lateral margins strongly sinuate and in front of the posterior angles dentate, the angles shortly obtusely spinously subprominent, basal margin truncate in front of scutellum, anterior margin slightly concave; scutellum much longer than broad at base, the apical area attenuated, a small black foveate spot at each basal angle; corium about as long as pronotum and scutellum together, the lateral margins a little rounded, the apical margins oblique; membrane passing the abdominal apex, the veins longitudinal; rostrum passing the anterior coxæ, first joint about or almost reaching base of head, second and third joints subequal in length; abdominal segments 1–5 with a transverse strigose vitta behind the spiracles; legs moderately long, posterior legs longest, posterior femora sulcate beneath and with two short spines near apex; tarsi triarticulate.

This genus appertains to the group of genera distinguished as Platycoraria, Bergr. (a name since altered by Kirkaldy to Diemeniini).

Myappena capito, sp. n.

Pale castaneous, thickly mottled with ochraceous, distinctly coarsely punctate; pronotum with a submarginal black line to the lateral margins, the margins of the cicatrices levigate ochraceous; scutellum with a black foveate spot at each basal angle, its apex narrowly pale ochraceous; membrane hyaline, reflecting the darker abdomen beneath, the veins darker; antennæ pale castaneous, extreme bases of third and fourth joints paler; body beneath and legs pale ochraceous; a submarginal line to prosternum, apices of lateral lobes of head beneath, a spot on each side of pro- and mesosterna, and apex of rostrum black; lateral margins of abdomen beneath testaceous red; legs thickly finely spotted with testaceous, tibiæ distinctly pilose; prosternum more or less distinctly darkly punctate; other structural characters as in generic diagnosis.

Long. 8–10½ mm.

Hab. Queensland; Peak Downs.

Genus Menida.

Menida, Motsch. Ét. Ent. x. p. 23 (1861).

Type, *M. violacea*, Motsch.

Menida spectabilis, sp. n.

Broadly ovate, somewhat convex above; head broad, subtruncate anteriorly, ochraceous, somewhat thickly brownly punctate; antennæ pale ochraceous, the apical joint (excluding base) fuscous; pronotum ochraceous, brownly punctate, the sublateral areas broadly suffused with black, extreme lateral margins pale ochraceous, on basal marginal area four large irregular black spots, somewhat fasciate in appearance, on central disk two small conspicuous black spots; scutellum ochraceous, brownly punctate, two central black fused spots at middle of basal margin, and a smaller one on each lateral margin near apex, a small levigate ochraceous spot at each basal angle; corium black, coarsely punctate, apical half of clavus and apical area of corium ochraceous, more or less blackly punctate, a prominent levigate ochraceous spot on disk at about one-third from apical margin; membrane greyishly subhyaline; body beneath and legs pale ochraceous, disk of metasternum blackly punctate, a small black spot on each side of pro- and mesosterna, spiracles blackish;

rostrum slightly passing the intermediate coxæ, its apex black.

Long. 8 mm.; exp. pronot. angl. 5 mm.

Hab. Queensland; Mackay (*R. E. Turner*, Brit. Mus.).

Menida inconstans, sp. n.

Ovate, moderately elongate; ochraceous, thickly piceously punctate; head less darkly punctate; antennæ ochraceous, third, fourth, and fifth joints with their apical areas more or less fuscous, first joint about or almost reaching apex of head, second scarcely longer than first, third longest, longer than either fourth or fifth, which are subequal in length; pronotum with a levigate whitish fascia between the pronotal angles, behind this fascia a transverse series of four black spots sometimes very indistinct, the lateral margins narrowly palely levigate; scutellum with some irregular black spots on basal margins, in some specimens these are very indistinct, a small black spot on each side of lateral margin near apex, which has its margin pale ochraceous; corium coarsely punctate; membrane hyaline, passing abdominal apex; body beneath and legs pale ochraceous; intermediate and posterior femora annulated with fuscous near apex, pro- and mesosterna more or less blackly punctate, a central blackish spot on apical abdominal segment; rostrum about or nearly reaching posterior coxæ; basal abdominal spine extended between the posterior coxæ.

Var. *a.*—The transverse pale levigate fascia to the pronotum replaced by a transverse series of very irregular pale levigate spots.

Var. *b.*—Pronotum with the transverse series of black spots on basal area, but without either the transverse pale levigate fascia or spots.

Long. 6½–8½ mm.; exp. pronot. angl. 4½ mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

Allied to *M. continuus*, Walk., from the island of Mysol.

VANDIEMENIA, gen. nov.

Head about as long as broad at base, lobes equal in length, lateral margins sinuate, the lateral lobes obliquely rounded at their apices, eyes large and prominent at base of head, scarcely reaching the anterior angles of the pronotum; antennæ robust, first joint not quite reaching apex of head, second, third, fourth, and fifth joints almost subequal in length; pronotum twice as broad as long, declivous anteriorly, basal margin concavely sinuate, anterior margin truncate, lateral margins oblique, slightly rounded, lateral angles subprominent, rounded; scutellum longer than broad, its apex rounded; corium as long as head and pronotum together; membrane passing the abdominal apex, the veins longitudinal; rostrum passing the posterior coxæ, first joint not reaching base of head, second extending to anterior coxæ, third to intermediate coxæ; sternal process not extending beyond anterior margin of prosternum, apically rounded and depressed to margin of prosternum; legs of moderate length, somewhat robust, femora distinctly thickened, posterior tarsi with the basal joint a little shorter than second and third joints together; sixth abdominal segment centrally long, apical segment short, broad, posteriorly concavely sinuate.

Allied to *Diaphyta* by the large size of the head, but differing in the structure of the sternal process, which is more laminate, raised, and roundly arched at termination, as is found in the genera arranged with *Rhynchocoris*.

Vandiemenia tasmani, sp. n.

Pale testaceous; lateral margins of head and margins of the central lobe (narrowly and not reaching apex) black; antennæ brownish ochraceous, fourth and fifth joints black; pronotum with the basal area sometimes suffused with blackish; lateral and apical margins of the scutellum narrowly black, sometimes obsoletely so towards apex; membrane pale fuliginous, subhyaline, reflecting the dark abdomen beneath; body beneath and legs pale testaceous, apices of tibiæ and the tarsi infuscate; a spot near anterior and intermediate acetabula, spots to connexivum (above and beneath) at segmental apices, and apex of rostrum black; upper surfaces of tibiæ thickly minutely spotted with black; head finely wrinkled; pronotum sparingly punctate, excluding the cicatricial areas, a distinct transverse series of strong punctures before the anterior margin, the lateral margins narrowly levigate and slightly reflexed; scutellum sparsely punctate, more strongly so on lateral margins and apical area; corium thickly finely punctate; other structural characters as in generic diagnosis.

Long., ♂ 10¼, ♀ 12 mm.; exp. pronot. angl., ♂ 6, ♀ 7 mm.

Hab. Tasmania; Launceston (Brit. Mus.).

Genus MORNA.

Morna, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 521.

Type, *M. cornuta*, Hagl.,=*leucospila*, Walk.

Morna leucospila.

Cuspicona leucospila, Walk. Cat. Het. ii. p. 387 (1867).

Kirkaldy, in his recent Catalogue, has placed this species as a synonym of *M. agressor*, Fabr. These two species are, however, quite distinct and not likely to be confused. *C. leucospila* is a smaller species, with the posterior pronotal angles more longly produced and more acute, and the scutellum is narrower. The type of *M. agressor* is in the Banksian collection, and with it I have compared the type of Walker's species.

Genus CUSPICONA.

Cuspicona, Dall. List Hem. i. p. 296 (1851).

Type, *C. thoracica*, Westw.

Cuspicona splendidula, sp. n.

Bright ochraceous; basal area of pronotum (including the lateral angles), a broad marginal fascia on each side of scutellum (not reaching base, but united and occupying apex), terminal abdominal spines (above and beneath), and the posterior angles of the prosternum sanguineous; head finely granulose; antennæ pale ochraceous, basal joint not quite reaching apex of head, second and third subequal in length, fourth and fifth thickened and subequal, apical area of third also thickened; pronotum thickly finely punctured, the lateral angles somewhat straightly and strongly angularly produced; scutellum sparsely finely punctate, more thickly so in the sanguineous areas; corium more coarsely punctate; membrane pale hyaline, reflecting the sanguineous hue of the abdomen beneath it; sternal process reaching base of head; abdomen beneath with a central longitudinal ridge.

Long. 10½ mm.; exp. pronot. angl. 7 mm.

Hab. Queensland (Brit. Mus.).

This beautiful species has no more precise locality than the above. It was purchased with other insects from Queensland in 1872.

Genus Pegala.

Pegala, Stål, Öfv. Vet.-Ak. Förh. 1867, p. 522.

Type, *P. biguttula*, Hagl.

Pegala figulina, sp. n.

Head, pronotum, and scutellum pale shining olivaceous green, with more or less ochraceous mottling; corium brownish ochraceous, with piceous punctures: membrane pale brownish, subhyaline, reflecting the dark abdomen beneath; body beneath pale testaceous, with darker and paler mottlings, the most prominent of the paler ones forming an indistinct and irregular submarginal abdominal fascia, the lateral abdominal margins olivaceous, lateral marginal areas of the prosternum broadly pale virescent, the lateral prosternal angles reddish testaceous; legs testaceous, the femora more or less prominently spotted with black; head finely transversely wrinkled, the central lobe anteriorly dull ochraceous, margined with piceous; antennæ ochraceous, first joint not quite reaching apex of head, second distinctly longer than first, a little shorter than either third, fourth, or fifth, which are subequal in length: pronotum with a few scattered coarse punctures, the lateral angles subprominent; scutellum sparsely coarsely punctate, more closely punctate on lateral areas; corium thickly coarsely punctate; sternal process reaching base of head; rostrum not quite reaching posterior coxæ; apical abdominal spines prominent.

Long. 12–13 mm.

Hab. North Queensland (*Kelsall*, Brit. Mus.).

Koogobatha, gen. nov.

Body broadly subovate; head about as long as broad at base including eyes, lobes of equal length, the apex broad and roundly truncate, lateral margins oblique and sinuate, eyes large and prominent, not extending beyond the anterior angles of the pronotum and distinctly separated from them posteriorly, ocelli in a line with the middle of the eyes and much nearer to them than to each other; antennæ five-jointed, first joint almost but not quite reaching apex of head, second and third joints longer and subequal in length, each shorter than fourth or fifth, which are also subequal; pronotum twice as broad between lateral angles as medially long, lateral margins oblique and moderately reflexed, anterior angles subprominent, lateral angles subprominent and obtusely toothed, anterior margin concave, callous, and posteriorly defined at its middle area by a transverse series of punctures, posterior margin almost straight, the posterior angles very slightly roundly subprominent; scutellum as long as broad, depressed a little beyond base, apex rounded; corium about as long as head and pronotum together, the costal margin a little convex; membrane passing abdominal apex, veins numerous and longitudinal, sometimes one or two furcate at apex; rostrum extending to the posterior coxæ, first joint reaching base of head, second slightly passing anterior coxæ, third reaching intermediate coxæ, sternal process not reaching apex of prosternum, anteriorly roundly obliquely depressed, posteriorly excavately bispinous for the reception of the apex of an abdominal basal tubercle; legs of moderate length, tarsi somewhat long, posterior tarsi with the basal joint almost as long as the remaining joints together; odoriferous orifice distinctly curved.

Allied to *Pegala*, Stål [*], but with the head broader and apex truncate, eyes distinctly removed from the anterior angles of the pronotum, proportional length of the antennal joints different, apex of scutellum rounded, not acute.

Koogobatha mirabilis, sp. n.

Colour bright and shining; head ochraceous, lateral margins narrowly, a broad central longitudinal fascia (broken posteriorly), and the base broadly black; antennæ black; pronotum ochraceous, with three prominent black spots, two (transverse) on anterior area, and the third rounded at middle near base; scutellum black; corium black, its basal angle ochraceous, and with a somewhat large reddish-testaceous discal patch on the posterior area; membrane black; body beneath pale ochraceous, a central rounded spot on each side of the process on mesosternum, a transverse spot on each side of the sternal segments, and four longitudinal series of spots to abdomen beneath (the largest on each side of disk) black; legs ochraceous, a broad annulation on apical halves of femora, the whole of the tibiæ and the tarsi more or less black; rostrum black; head finely transversely wrinkled on each lateral area; pronotum very finely and obscurely punctate; scutellum sparsely punctate, corium thickly coarsely punctate; other structural characters as in generic diagnosis.

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[*] In reference to the structural characters of *Pegala*, Stål, those given by Haglund of the typical species *P. guttula* (Stett. ent. Zeit. 1868, p. 159), on which the genus is founded, should be consulted.

Long. 14–17 mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

MYGOODANO, gen. nov.

Head subtriangular, about as long as breadth of head at base including eyes, obliquely deflected, the central lobe slightly projecting beyond the lateral lobes, lateral margins distinctly sinuate; antennæ five-jointed, basal joint not reaching apex of head, second and third each longer than first and subequal in length, each shorter than either fourth or fifth, which are also subequal in length; pronotum strongly obliquely declivous, basal margin concavely sinuate, lateral angles strongly spinously produced, posterior angles a little roundly prominent, lateral margins almost obliquely straight; scutellum longer than broad at base, its apex not angulate but rounded, the apical area distinctly narrowed; corium about as long as head and pronotum together; membrane distinctly passing the abdominal apex; sternal process reaching the bucculæ, but not deflected to head; rostrum slightly passing the intermediate coxæ, first joint not reaching base of head, second extending to anterior coxæ, third reaching to about midway between the anterior and intermediate coxæ; apical angles of the sixth abdominal segment strongly longly produced.

Allied to *Hoffmanseggiella*, Stål, but differing by the much more attenuate and apically rounded scutellum; central lobe of head slightly projecting beyond the lateral lobes.

Mygoodano virescens, sp. n.

Bright, shining, olivaceous green; apical area of head pale ochraceous; antennæ brownish ochraceous, the basal joint paler, apical area of third and the whole of the fourth and fifth joints more or less infuscate, apices of the pronotal lateral angles black; body beneath and legs pale virescent, inclining to ochraceous in faded specimens; rostrum, apical area of sternal process beneath, and the tarsi brownish ochraceous, tarsal claws and apex of rostrum black; apical spines to abdomen above and beneath reddish ochraceous, with their inner margins and apices black; head finely transversely wrinkled; pronotum coarsely punctate, more finely punctate on basal and anterior areas, the lateral margins levigate, the lateral angles strongly spinously produced, their apices distinctly curved backward; scutellum somewhat thickly punctate, more coarsely so on basal area; corium thickly coarsely punctate; prosternum thickly punctate; other structural characters as in generic diagnosis.

Long. 10½ mm.; exp. pronot. angl. 8 mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

Genus Vitellus.

Vitellus, Stål, Ann. Soc. Ent. Fr. (4) v. p. 170 (1867).

Type, *V. insularis,* Stål.

Vitellus bovillus, sp. n.

Olivaceous green; head, anterior marginal area of pronotum, body beneath, and legs much paler, either pale ochraceous or pale virescent; antennæ with the first and second joints ochraceous, third, fourth, and fifth infuscate, first not nearly reaching apex of head, second longer than first, shorter than third; third, fourth, and fifth almost subequal in length; head distinctly transversely wrinkled; pronotum somewhat regularly punctate about two-thirds from base, the anterior third impunctate, with a transverse series of punctures behind the anterior margin but not extending to the anterior angles, lateral angles long and moderately recurved, about as long as breadth of scutellum at base, black above and red beneath; scutellum sparsely irregularly punctate, more thickly so on apical area; corium coarsely punctate, red at basal angle; membrane shining brown; rostrum just passing the posterior coxæ, its apex black; a black spot before the odoriferous apertures; apical abdominal spines black, beneath red at base.

Long. 13–14 mm.; exp. pronot. angl. 12–13 mm.

Hab. Queensland (*F. P. Dodd,* Brit. Mus.).

By the general shape and structure of the lateral pronotal angles this species is allied to the Celebesian *V. strenuus,* Walk., but in the latter the rostrum reaches the third abdominal segment; from the description of Walker it also seems to be allied to his *V. rufolinea.*

Vitellus taurus, sp. n.

Bright olivaceous green; lateral pronotal angles piceous, their apices testaceous red; base of apical margin and a few small spots at base of corium ochraceous; apical abdominal spines reddish ochraceous, their inner margins narrowly black; body beneath and legs pale virescent, inclining to ochraceous; antennæ pale virescent, first joint not nearly reaching apex of head, second longer than first, a little shorter than third; third, fourth, and fifth subequal in length, the apical joint moderately infuscate; head transversely wrinkled; pronotum somewhat thickly coarsely punctate, the lateral angles strongly straightly produced; scutellum and corium thickly punctate; membrane hyaline and passing abdominal apex; rostrum reaching the base of the fourth abdominal segment, its apex black.

Long. 16½ mm.; exp. pronot. angl. 12–13½ mm.

Hab. New South Wales; Cumberland (Brit. Mus.).

Allied to *V. antemna*, Bredd., but differing in the shorter rostrum &c.

Genus Garceus.

Garceus, Dist. Ann. & Mag. Nat. Hist. (6) xi. p. 434 (1893).

Type, *G. fidelis*, Dist.

Since I founded this genus on a single specimen the British Museum has acquired a fair series of examples, and I now amplify my description and in one respect correct it. My specimen led me to suppose that the antennæ were four-jointed; from the more perfect specimens now before me I find that they are five-jointed.

Antennæ composed of five joints, first not reaching apex of head, second, fourth, and fifth longest and subequal in length, third short, subequal to first; central lobe of head about half its length, the lateral lobes united beyond it, obtusely spinously dilated in front of the eyes; scutellum a little longer than head and pronotum together, becoming distinctly more or less acuminate behind middle; greatest length of corium a little shorter than pronotum and scutellum together; membrane not quite reaching or slightly passing the abdominal apex; mesosternum between the anterior and intermediate coxæ with a transverse process, narrowing and elevately terminating anteriorly between the anterior coxæ, and centrally longitudinally sulcate; between the intermediate and posterior coxæ, but extending behind the last, an elevated flat process, the base of which reaches the apex of the second abdominal segment; odoriferous apertures very distinct, transverse, somewhat short and apically a little raised; rostrum passing the anterior coxæ, first joint not quite reaching base of head, second extending to anterior coxæ, third and fourth joints short, subequal in length.

Garceus fidelis.

Garceus fidelis, Dist. Ann. & Mag. Nat. Hist. (6) xi. p. 435 (1893).

Long., ♂ ♀, 16–20 mm.

Hab. Queensland; Townsville (*F. P. Dodd,* Brit. Mus.). Peak Downs (Coll. Dist.).

In freshly coloured specimens the first, second, and third joints and the base of the fourth joint of the antennæ are reddish testaceous.

Genus ROEBOURNEA.

Roebournea, Schout. Ann. Soc. Ent. Belg. 1906, p. 144.

Type, *R. diversa*, Dist.

Roebournea diversa.

Basicryptus diversus, Dist. Ann. & Mag. Nat. Hist. (7) vi. p. 223 (1900).
Phyllocephala tumidifrons, Van Duz. Bull. Amer. Mus. xxi. p. 211, pl. viii. fig. 12 (1905).
Roebournea tumidifrons, Schout. Ann. Soc. Ent. Belg. 1906, p. 144.
Dalsira diversa, Kirk. Cat. Hem. (Heteropt.) p. 245 (1909).

Hab. W. Australia; Nicol Bay Distr. (*Dr. Clement,* Brit. Mus.). Roebourne (Coll. Van Duzée). Swan River (Coll. Dist.).

BORRICHIAS, gen. nov.

Head with the lateral lobes longly, straightly projecting beyond the central lobe in the form of two robust spines with their apices subacute; ocelli at base, near eyes; antennæ five-jointed, first joint scarcely extending to half the length of the lateral lobes, first and second subequal in length, third slightly longer than second and subequal to fourth, fifth longest; pronotum about twice as broad at base as medial length, the lateral angles produced in long, strong, anteriorly directed spines, their apices subacute, lateral margins before the lateral angles somewhat strongly dentate, near middle a transverse ridge, before which the disk is declivous to anterior margin, which is slightly concave, basal margin truncate; scutellum slightly longer than broad at base, sinuate at middle, the apex broadly subtruncately rounded, extending considerably over base of membrane; corium nearly as long as head and pronotum together, its lateral margin convex; membrane not reaching apex of abdomen, the veins more or less furcate; connexivum exposed; rostrum robust, not extending beyond the anterior coxæ, first joint not extending beyond the bucculæ, which are moderately raised and arched, second joint shorter than fourth; abdomen beneath convex; sternum with a narrow arched process between the anterior and intermediate coxæ; legs of moderate length, posterior femora slightly curved and subequal in length to posterior tibiæ; tarsi three-jointed, posterior tarsi with the first joint almost as long as the second and third together.

A genus to be placed near *Dalsira.*

Borrichias taurus, sp. n.

Dull brownish ochraceous, blackly punctate; outer margins of the lateral lobes black, their apical areas paler and almost impunctate; antennæ pale testaceous, first, second, and third joints distinctly mottled with black; pronotum blackly punctate, the lateral margins, margins of the lateral angles, the medial transverse ridge, and the basal margin pale ochraceous, impunctate, the sublateral margins and submarginal lines to lateral angles black; scutellum irregularly sparsely blackly punctate, with a prominent longitudinal medial fascia of dense black punctures not reaching apex, bordered on each side by a pale levigate narrow area; corium somewhat thickly darkly punctate, an inner black streak near base of scutellum, and a longitudinal black line on disk; membrane pale brown; connexivum with the extreme lateral margins pale levigate ochraceous, inwardly margined with black; body beneath and legs ochraceous, sternum, lateral areas of abdomen, and the femora thickly blackly punctate; rostrum with the apices of second and third and the whole of the fourth joint black; other structural characters as in generic diagnosis.

Long. 19 mm.; exp. pronot. angl. 12½ mm.

Hab. Centr. Australia; Hermansburg (*H. J. Hillier*, Brit. Mus.).

EUPOLEMUS, gen. nov.

Ovately subelongate; head longer than broad, central lobe slightly longer than lateral lobes, lateral margins sinuate, moderately narrowing to apex; antennæ with the first joint reaching or slightly passing the apex of the head, second slightly shorter than first or subequal to it, third and fourth subequal in length, each longer than fifth; pronotum nearly twice as broad at base as long, obliquely narrowing to eyes, lateral margins strongly reflexed, lateral angles rounded, not produced, anterior margin slightly concave, posterior margin truncate; scutellum longer than broad at base, obliquely narrowing to about one-fourth from apex, and then more suddenly narrowed to apex, which is subacute; corium longer than head and pronotum together, connexivum exposed from about half its length from base, membrane slightly passing the abdominal apex; bucculæ and first joint of rostrum reaching base of head, second joint extending to anterior coxæ, third reaching to midway between the anterior and intermediate coxæ, fourth not extended beyond the intermediate coxæ; basal abdominal spine not produced beyond the posterior coxæ; mesosternum non-carinate, but moderately centrally laminately elevate, prosternum obscurely centrally broadly sulcate; tarsi two-jointed, basal joint moderately thickened.

Type, *E. picturatus*, Dist.

Allied to *Abulites* and *Anubis*.

Eupolemus picturatus, sp. n.

Ochraceous, darkly punctate; antennæ testaceous red, apices of third and fourth joints and the whole of the fifth black; head thickly darkly punctate (excluding an impunctate space before each eye), two obscure, central, short testaceous lines at base; pronotum thickly darkly punctate, extreme lateral margins and the areas of the cicatrices pale, impunctate, a central spot on anterior area and a lateral submarginal fascia black; scutellum more sparingly punctate, the apex almost impunctate, an elongate black spot at each basal angle, a shorter black spot interiorly, and between them a levigate ochraceous spot; corium posteriorly more or less shaded with testaceous, thickly punctate, and with a prominent black spot on each side of apex of scutellum; membrane dull greyish, more or less streaked with fuscous; connexivum spotted with black; body beneath ochraceous, lateral marginal areas of prosternum blackly punctate, two central spots to mesosternum and a sublateral spot to both meso- and metasterna black; rostrum more or less piceous, apical joint of tarsi black; structural characters as in generic diagnosis.

Long. 6–7 mm.

Hab. Tasmania; Mount Wellington (*Lea*, Brit. Mus.). Hobart (Brit. Mus.).

Eupolemus insularis, sp. n.

Head and pronotum ochraceous, thickly coarsely punctate, lateral margins of pronotum and the areas of the cicatrices pale levigate ochraceous; antennæ testaceous, apical joint (excluding base) black; scutellum pale stramineous, sparingly punctate, a large punctate spot at the middle of base, and the marginal punctures castaneous, an elongate black spot at each basal angle; corium pale stramineous, its inner area and the clavus more or less testaceous, a black spot at inner angle on each side of apex of scutellum; membrane hyaline; connexivum very finely spotted with black; body beneath and legs pale ochraceous; apex of rostrum black.

Long. 7–8 mm.

Hab. King Island (N. of Tasmania). Tasmania; Launceston, Hobart (Brit. Mus.).

CENSORINUS, gen. nov.

Allied to *Eupolemus*, Dist., but with the scutellum broader at base than long, subtriangular, almost equilateral to near apex, where it is suddenly narrowed, the apex obtusely subacute; pronotum twice as broad as long; corium as long but not longer than head and pronotum together.

Censorinus tasmanicus, sp. n.

Pale greyish, thickly punctate, basal area of the scutellum broadly transversely castaneous; head thickly darkly punctate, the lateral margins sinuate, the central lobe a little longer than the lateral lobes; antennæ brownish ochraceous, the fifth joint (excluding base) black, basal joint almost but not quite reaching apex of head, first, second, and third joints almost subequal in length; pronotum thickly finely punctate, more sparingly so on basal area and not at all on the areas of the cicatrices, lateral margins somewhat strongly recurved and blackly punctate; scutellum sparsely punctate, more densely punctate on the basal castaneous area; corium thickly punctate; membrane hyaline, slightly passing the abdominal apex; body beneath stramineous, legs pale ochraceous; abdomen beneath and lateral areas of the prosternum thickly, rather coarsely punctate; tarsi two-jointed, posterior tarsi with the first joint slightly shorter than the second.

Long. 7 mm.

Hab. Tasmania; Hobart (*A. M. Lea*, Brit. Mus.). Bruni Island (*Lea*, Brit. Mus.).

Genus Amphaces.

Amphaces, Dall. List Hem. i. pp. 198 & 295 (1851).

Type, *A. ferruginea*, Dall.

Amphaces tibialis, sp. n.

Head ochraceous, coarsely transversely wrinkled, more or less punctate, lateral margins in front of eyes distinctly obtusely angulate, a somewhat raised and levigate spot near inner margin of each eye, eyes black; antennæ mutilated in typical specimen, basal joint passing apex of head; pronotum ochraceous, basal half more or less suffused with sanguineous and irregularly wrinkled, coarsely punctate, more finely punctate on anterior and lateral areas, the cicatrices pale ochraceous and levigate; scutellum reddish testaceous, with two black spots at base in longitudinal series and continued in a narrow subobsolete line to near apex, moderately thickly punctate and irregularly finely wrinkled; corium brownish ochraceous, thickly rather coarsely punctate, membrane subhyaline, passing the abdominal apex, and with a prominent shining black spot at the basal angle near apex of clavus; body beneath and legs pale ochraceous, tibiæ and tarsi more or less piceous; rostrum with the second joint and apex blackish and just passing the intermediate coxæ; abdominal basal spine slightly passing the posterior coxæ.

Long. 11 mm.

Hab. Tasmania; Franklin (*Com. Walker*, Brit. Mus.).

Collected during the cruise of H.M.S. 'Penguin.'

Allied to *A. proxima*, Dall., from which it differs by the more angularly dilated lateral margin of the corium, the dark tibiæ and tarsi.

Amphaces elongata, sp. n.

Elongate; pale testaceous, thickly punctate; head somewhat finely punctate, the lateral margins concavely sinuate and preceded by a linear series of darker punctures, in front of eyes very obtusely angulate; antennæ with the first and second joints brownish ochraceous, third black, with its apex pale ochraceous, fourth black, with base and apex pale ochraceous, first joint longly passing apex of head, second longest but not twice as long as third, which is shortest, fifth mutilated in typical specimen; pronotum coarsely punctate, the lateral margins preceded by black punctures; scutellum coarsely punctate, with a central, raised, longitudinal, levigate line, not reaching base, a small pale levigate spot at each basal angle; corium thickly coarsely punctate, more sparingly so on inner area; membrane pale brownish ochraceous, subhyaline, not passing the abdominal apex; connexivum black, the last two segments purplish red, the lateral and basal margins of all the segments pale ochraceous; body beneath and legs ochraceous; rostrum reaching the posterior coxæ, its apex black; abdominal basal spine distinctly passing the posterior coxæ.

Long. 11½ mm.; exp. pronot. angl. 5⅔ mm.

Hab. Tasmania; Launceston (*F. M. Littler*).

An elongate species, with the lateral margins of the corium not dilated.

MOCHUS, gen. nov.

Head with the central lobe a little longer than the lateral lobes, the lateral margins strongly reflexed and sinuate, ocelli a little nearer eyes than to each other; antennæ five-jointed, the first joint long, longly passing apex of head, about as long as the pronotum, moderately curved, first and second joints subequal in length, third shorter than second, longer than fourth, apical joint moderately thickened, subequal to fourth; pronotum slightly more than twice broader between the lateral angles than medial length, the lateral areas broadly and laminately expanded and a little directed upwardly, their margins straightly oblique, the lateral angles strongly produced and broadly acute, anterior margin truncate, anterior angles slightly prominent; posterior margin moderately concave; scutellum about as long as broad at base, subtriangular, the apex narrowed, not extending beyond the base of the membrane; corium about as long as head and pronotum together, the apex angularly rounded; membrane passing abdominal apex; rostrum reaching the base of the ventral spine, first joint extending beyond the base of head, second reaching the intermediate coxæ, third and fourth almost subequal in length; prosternum broadly sulcate, the sulcation margined on each side with a carinate elevation; abdominal ventral spine extending before the anterior coxæ; abdomen beneath centrally longitudinally ridged; femora moderately thickened; tarsi two-jointed, joints almost subequal in length.

Allied to *Duadicus*, but lateral margins of the pronotum not crenulate and obliquely straight, not strongly sinuate; antennæ longer and proportional lengths of joints different; first joint of rostrum passing base of head, &c.

Mochus fortis, sp. n.

Head and pronotum testaceous, coarsely darkly punctate; basal area of head, basal marginal area of pronotum (including the lateral angles), and the areas of the pronotal cicatrices black, the anterior half of the pronotal lateral areas subhyaline, talc-like; scutellum black on basal and ochraceous on apical area, both coarsely punctate, the middle disk macularly stramineous and impunctate; corium pale testaceous, thickly, coarsely, darkly punctate, the apical area distinctly paler, and a levigate ochraceous spot on posterior disk; membrane greyish, the longitudinal veins prominent; body beneath and legs ochraceous, sternum and submarginal areas to abdomen more or less castaneous, apical margin black; sternum coarsely punctate; other structural characters as in generic diagnosis.

Long. 8½ mm.; exp. pronot. angl. 6½ mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

Hiarchas, gen. nov.

Head a little longer than broad, narrowed anteriorly, the central lobe slightly longer than the lateral lobes, which are outwardly moderately sinuate and reflexed; eyes not projecting beyond the anterior angles of the pronotum; ocelli nearer eyes than to each other; antennæ robust, first joint passing apex of head, second longest, third, fourth, and fifth almost subequal in length, but fourth and fifth distinctly incrassate; pronotum about half as long as width at base, the lateral margins oblique, slightly rounded, a little reflexed, anterior margin strongly concave for the reception of the head, lateral angles subangularly rounded, posterior margin truncate before scutellum, posterior angles a little obliquely rounded; scutellum longer than broad at base, distinctly narrowed at about one-third before apex; corium about as long as pronotum and scutellum together, at base of lateral margins a little ampliate, apical margins oblique, slightly sinuate; membrane passing abdominal apex; rostrum robust, extending to between the anterior and intermediate coxæ, bucculæ elevated, first rostral joint short, not extending beyond apical half of head, second about reaching base of head, third extending to the anterior coxæ; prosternum broadly sulcate, ventral spine scarcely or slightly passing the anterior coxæ; tarsi two-jointed.

Type, *H. crassicornis*, Walk.

Hiarchas crassicornis.

Stauralia crassicornis, Walk. Cat. Het. ii. p. 377 (1867).

Hab. Adelaide.

Hiarchas terminalis.

Stauralia terminalis, Walk. Cat. Het. ii. p. 378 (1867).

Hab. Melbourne.

Genus STAURALIA.

Stauralia, Dall. List Hem. i. pp. 197 & 294 (1851).

Type, *S. chloracantha*, Dall.

Stauralia littleri, sp. n.

Body above testaceous red, margins of central lobe and basal area of head, two large transverse spots on anterior area of pronotum, body beneath, and legs ochraceous; membrane hyaline, distinctly passing abdominal apex; head with the lateral margins distinctly reflexed and inwardly blackish, laterally transversely striate; antennæ testaceous, about apical half of fourth and the whole of fifth joint infuscate, first joint distinctly passing apex of head, second longer than third, fourth and fifth subequal in length; pronotum (excluding the ochraceous spots) thickly coarsely punctate and more or less wrinkled, the lateral margins oblique and distinctly reflexed, the lateral angles rounded; scutellum triangular, nearly equilateral, apex finely pointed and black, thickly punctate and slightly wrinkled; corium thickly coarsely punctate; membrane hyaline and distinctly passing abdominal apex; ventral spine long, virescent and passing the anterior coxæ; rostrum virescent, reaching the posterior coxæ, its apex black, first joint not quite reaching base of head, second about reaching anterior coxæ, third not quite reaching intermediate coxæ; abdomen beneath with a central longitudinal ridge; tarsi two-jointed, posterior tarsi with the joints almost subequal in length.

Long. 8–10 mm.

Hab. Tasmania; Launceston (*Littler*).

Genus SASTRAGALA.

Sastragala, Amy. & Serv. Hist. Hém. p. 155 (1843).

Type, *S. uniguttata*, Don.

Sastragala versicolor, sp. n.

Head, pronotum, and corium virescent; lateral pronotal angles and apical margin of corium black; posterior marginal area of pronotum and the scutellum castaneous brown; scutellum with a large discal cordate ochraceous spot; body beneath and legs virescent or ochraceous, probably altogether virescent in fresh specimens; head with the lateral lobes transversely wrinkled; antennæ greenish ochraceous, first joint passing apex of head, second a little shorter than third, which is almost subequal to fourth, apex of fourth infuscate, fifth mutilated in type; pronotum somewhat sparingly punctate, on basal area the punctures distinctly coarser, the lateral angles somewhat longly subspinously produced and distinctly recurved; scutellum thickly punctate, the ochraceous spot impunctate, extreme apex ochraceous and impunctate; corium thickly punctate; membrane hyaline, distinctly passing the abdominal apex; apical margin of abdomen above black; rostrum slightly passing posterior coxæ; mesosternal process not passing anterior margin of prosternum nor between the intermediate coxæ posteriorly produced; abdominal spine produced between the posterior coxæ; abdomen beneath centrally longitudinally ridged.

Long. 11 mm.; exp. pronot. angl. 7½ mm.

Hab. Queensland (*F. P. Dodd*, Brit. Mus.).

LXIV.—*The Generic Arrangement of the Australian Murines hitherto referred to* "Mus." By OLDFIELD THOMAS.

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THE recent separation by Mr. G. S. Miller* of the *Mus musculus* group as a special genus, and the use of the name *Epimys* for other rats previously called *Mus*, makes it a pressing task to determine what restricted genera exist in Australia and what their names should be. For to start with calling them all *Epimys* and then later on to have to change their names again would be most inconvenient, so that an immediate revision is called for. There is also a special reason for the Australian forms being sorted, as among them occurs the type of "*Pseudomys*," a name actually earlier than *Epimys*, and until a reason could be shown for its separation from the latter, the proper generic name of all true rats from *Mus rattus* downwards would remain in doubt.

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* P. Biol. Soc. Wash. xxiii. p. 57 (1910).

I have not as yet been able to make any observations on the characters and synonymy of the species, but have simply taken all the types and authentic specimens in the Museum and grouped them in genera. So rich, however, is the Museum collection in types that this method allocates the great majority of the described species without introducing any element of doubt as to the correct determination of species of which we do not possess typical examples.

Certain groups of Australian Muridæ have already been dealt with [*], namely those with elongate feet and those with a postero-internal cusp on the upper molars, and there now only remain the ordinary rat- and mouse-like forms without the extra cusp on the molars.

A careful examination of these shows that none of them, except the introduced *M. musculus*, are referable to true *Mus*, that about half may be retained in *Epimys*, the genus of which "*Mus rattus*" is typical, and that the other half may be referred to the specially Australian genus *Pseudomys*, which may itself be divided into four subgenera.

The characters and included species of these groups are as follows:—

EPIMYS, Trouess.

Size uniformly large; all Australian species being "rats" and not "mice." Pectoral mammæ believed to be always present, the formula, where known, varying from 1—2=6 to 3—3=12.

Skull strongly built, with well-marked supraorbital ridges, which generally extend back to the outer corners of the interparietal. Front edge of zygomatic plate always convex. Pterygoids as in *E. rattus*, the parapterygoid fossa deep and well defined.

Molars normal, the laminæ never specially tilted up; no cingular cusp on m^1.

Range. Whole of Old World, except Madagascar and the far north.

Type. E. rattus, L.

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[*] Ann. & Mag. Nat. Hist. (7) xvii. p. 81 (1906); *op. cit.* (8) iii. p. 37 (1909).

Australian and Papuan species :—

arboricola, Rams. (=*rattus*).
assimilis, Gould.
browni, Alst.
colletti, Thos.
culmorum, Thos. & Dollm.
exulans, Peale.
fuscipes, Waterh.
gestri, Thos.
greyi, Gray.
lutreola, Gray.
manicatus, Gould.
maorium, Hutt.
mordax, Thos.
prætor, Thos.
sordidus, Gould.
terræ-reginæ, Alst.
tunneyi, Thos.
vellerosus, Gray.
velutinus, Thos.
villosissimus, Waite.
woodwardi, Thos.

PSEUDOMYS, Gray.

P. Z. S. 1832, p. 39.

Size variable, mostly much smaller than in *Epimys*. Pectoral mammæ not known to be present in any species, the formula being 0—2=4 in all in which it can be determined.

Skull not heavily built and quite without supraorbital ridges; the interorbital region narrow, parallel-sided, with rounded or, in a few species, squared edges. Front edge of zygomatic plate, structure of pterygoid region and of molars, varying in the different subgenera.

Range. Australia and Tasmania, not extending into New Guinea.

Type. *Pseudomys australis*, Gray.

This genus contains species of very varied skull and molar structure, and it is with some hesitation that I leave such diverse species as, for example, *P. australis* and *P. forresti* under the same generic heading. But as the characters, marked as they are in extreme cases, seem to be slighter or variable in others, I think the division of *Pseudomys* into subgenera may best serve our present purpose.

Of these there would be four, as follows :—

1. PSEUDOMYS, s. s.

Size large. General form of skull inclining towards that of *Conilurus* and *Leporillus* by the flat or even concave condition of the posterior nasal region and the bold projection of the anterior part of the zygomata. Front edge of zygomatic plate concave, with a projecting point above, as in *Notomys*, though not so strongly marked. Palatal foramina large. Pterygoid region showing an intermediate condition between the normal one and the flattened state described below under

Leggadina. Mesopterygoid fossa broad in front, narrowing backwards.

Molars high, with heavy cusps, more or less resembling those of *Leporillus*. No antero-internal secondary cingular cusp on m^1 (except as an unusual abnormality).

Type. *Ps. australis*, Gray.

Other species :—

Ps. auritus, sp. n. (see succeeding paper).
Ps. higginsi, Trouess.
Ps. lineolatus, Gould.
Ps. murinus, Gould * (probably =*australis*).
Ps. shortridgei, Thos.

2. THETOMYS, subg. n.

Size medium. Form of skull more normal, but the anterior plate of zygoma still concave in front. Palatal foramina fairly long, but not widely open. Pterygoid region normally murine.

Molars fairly normal, but a distinct antero-internal cingular cusp present on m^1. Molar laminæ not specially tilted up.

Type. *Pseudomys* (*Thetomys*) *nanus* (*Mus nanus*, Gould).

Other species :—

Ps. ferculinus, Thos.
Ps. gouldi, Gray.
Ps. gracilicauda, Gould.
Ps. præconis, sp. n. (see succeeding paper).

3. LEGGADINA, subg. n.

Size small. Form of skull normal. Anterior zygomatic plate straight or convex in front as in ordinary murines. Palatal foramina narrow. Pterygoid region peculiar, the parapterygoid fossæ broad and very shallow, scarcely hollowed at all, the ectopterygoids bordering it externally low, flat, not or scarcely raised up above the level of its floor ; entopterygoids also much lower and less projecting than usual.

Molars very variable, but always with a well-marked antero-internal cingular cusp on m^1. In *P. delicatulus* this is small, in *hermannsburgensis* intermediate, and in *forresti* very large. In proportion to the development of this cusp the laminæ are themselves tilted backwards internally, while the outer cusps are reduced in size.

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* In my paper of 1906, "On the Generic Arrangement of the Australian Rats hitherto referred to *Conilurus*," this species, following Gould, was erroneously united with "*C. apicalis*" in the new genus *Leporillus*, *apicalis* being chosen as the type. As a result of this mistake, the generic description of *Leporillus* is not altogether applicable, and (an accidental *lapsus calami* being also corrected) may run as follows :—Molars, as in *Notomys*, without postero-internal cusps. Skull very much as in *Conilurus*. Hind feet normal, with the usual six pads.

Type. Pseudomys (*Leggadina*) *forresti* (*Mus forresti*, Thos.).

Other species:—

Ps. delicatulus, Gould.
Ps. hermannsburgensis, Waite.
Ps. patrius, Thos. & Dollm.

4. GYOMYS, subg. n.

Size small. Skull as in *Leggadina*.

Molars quite normal; no anterior cingular cusp on m^1, and the molar laminæ quite of the usual murine shape and position.

Type. Pseudomys (*Gyomys*) *novæ-hollandiæ* (*Mus novæ-hollandiæ*, Waterh.).

Other species:—*Ps. albo-cinereus*, Gould, and subsp. *squalorum*, Thos. *Ps.* (*Gyomys*) *glaucus*, sp. n. (described in succeeding paper).

LXV.—*New Australian* Muridæ *of the Genus* Pseudomys.

By OLDFIELD THOMAS.

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IN working out the genera of Australian Muridæ the following new species have come to light:—

Pseudomys auritus, sp. n.

Hapalotis murinus, Gould, Mamm. Austr. vol. iii. pl. vii. (1855); nec id. P. Z. S. 1845, p. 78.

A large species with long ears.

Size largest of the genus. General appearance very much as in *Ps. lineolatus*, but the ears conspicuously longer. Fur long, soft, and thick; the wool-hairs of back about 14 mm. in length, the longer hairs surpassing them by about 4·5 mm. General colour dark fawn-grey, heavily darkened on the back by the blackish tips of the longer hairs. Under surface soiled buffy, the hairs dark slaty for two-thirds their length, their ends "pinkish buff"; no line of demarcation laterally. Ears very long; proectote black with greyish-white tip, sparse hairs of metentote also greyish white. Hands and feet silvery white. Tail well haired, brown above, white below.

Skull as usual in the restricted subgenus *Pseudomys*, larger than in any other species. The teeth fairly broad.

Dimensions:—

Head and body (stuffed) 130 mm.; tail (of another specimen) 125; hind foot 32; ear (dry) 26.

Skull: molar series of type 6·4.

Another skull from same locality: greatest length 35·5; basilar length 30; greatest breadth 28·5; nasals 14·8; interorbital breadth 4·5; breadth of brain-case 15·2; palatilar length 18; palatal foramina 9·2; upper molar series 6·3.

Hab. South Australia. Type from Lake Albert.

Type. Adult. B.M. no. 53. 10. 22. 6. Collected by F. Strange; purchased of Mr. Gould. Two specimens and a separate skull. Also two from "S. Australia," presented by Sir George Grey, and one presented by Lord Derby.

The original *Hapalotis murinus*, Gould, was described from New South Wales on a specimen now in the Museum (no. 53. 10. 22. 4). This specimen is allied to, if not identical with, the far earlier *Pseudomys australis*, Gray, and Gould was clearly in error in assigning to the same species the series collected by Mr. Strange at Lake Albert, S. Australia. The former has the ears of about the normal size, while in the latter they are conspicuously larger than usual, and afford a ready means of identifying the present species. No doubt Gould's beautiful plate, which is as nearly perfect as any illustration can be, was drawn mainly from his fresh series from Lake Albert.

Pseudomys (*Thetomys*) *præconis*, sp. n.

A medium-sized blue-grey species with long tail.

Fur rather loose and shaggy, not so soft and fine as in *Ps. albocinereus*, to which this species has a superficial resemblance. Hairs of back about 14 mm. in length, the longer bristles and hairs reaching 18. General colour above "drab-grey," the median dorsal area browner, the sides clearer grey. Flanks slightly buffy. Under surface soiled greyish, the bases of the hairs slaty, the ends dull creamy. Ears long, dark brown. Hands and feet dull whitish. Tail long, well haired, slightly tufted terminally, brown above, blackening towards the tip, whitish on sides and below.

Skull about as large as that of *Ps. gouldi* or *glaucus*, but differing from the latter by the undercut anterior zygoma-root and the anterior supplementary cusp of m^1 characteristic of *Thetomys*. Supraorbital edges square, neither rounded nor ridged. Palatal foramina long and narrow. Incisors slender, more so than in *Ps. nanus*. Molars light and delicate.

Dimensions of the type (measured in skin):—

Head and body 113 mm.; tail 129; hind foot (wet 26); ear (wet) 21.

Skull: greatest length 30; zygomatic breadth 15; nasals 12; interorbital breadth 4; breadth of brain-case 13·7; palatilar length 13·3; palatal foramina 6·6; upper molar series 4·8.

Hab. Shark's Bay, Western Australia. Type from Peron's Peninsula; a picked-up skull from Bernier Island (*Shortridge*).

Type. Old female. B.M. no. 58. 12. 27. 14. Collected by Dr. F. M. Rayner during the voyage of the 'Herald'; presented by the Admiralty.

This pretty mouse has a superficial resemblance to *Ps. albocinereus* (which has a local subspecies on Shark's Bay—*Ps. a. squalorum*), but is really more nearly related to the *Ps. nanus* group. It is readily distinguishable by its pale colour and long bicolor tail.

During the Balston exploration of W. Australia, Mr. Shortridge picked up a dried skull of *Ps. præconis* on Bernier Island, but he thought that the animal had become extinct there. The type was obtained during the historic voyage of the 'Herald' in 1858.

Pseudomys (*Gyomys*) *glaucus*, sp. n.

A large eastern representative of *Ps. albocinereus*.

Size largest of the subgenus. Fur soft and fine; hairs of back about 11–12 mm. in length. General colour pale blue-grey, not so pale as in *albocinereus*; under surface paler grey, the bases of the hairs slaty, their tips greyish white. Ears of medium length, greyish. Hands and feet silvery white; last hind sole-pad small, round. Tail rather longer than head and body, pale brown above, white on the sides and below.

Skull in general characters quite like that of *Ps. albocinereus*, but larger and more robust throughout. Anterior zygomatic plate more projected forward.

Dimensions of the type (measured on the spirit specimen):—

Head and body 93 mm.; tail 111; hind foot 22·5; ear 18.

Skull: greatest length 29; basilar length 22·5; zygomatic breadth 14·6; breadth of brain-case 13; palatilar length 12·8; palatal foramina 5·3; upper molar series 4·2.

Hab. South Queensland.

Type. Adult male in spirit. B.M. no. 92. 8. 7. 2. Presented by the Brisbane Museum. A second specimen, without exact locality, in skin.

This is evidently an eastern representative of the beautiful little West Australian *Ps. albocinereus,* with which it shares the general characters and blue-grey colour, but from which it may be readily distinguished by its much greater size.

LXVI.—*A new Genus for* Dactylopsila palpator.

By OLDFIELD THOMAS.

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THE British Museum owes to Mr. Walter Goodfellow a skin with skull of the remarkable marsupial described by Milne-Edwards as *Dactylopsila palpator* [*], and a careful study of it leads me to think it should be separated generically from true *Dactylopsila.*

DACTYLONAX, gen. nov.

Type. Dactylonax palpator (*Dactylopsila palpator,* M.-Edw.).

General characters as in *Dactylopsila,* but fourth finger much lengthened, very slender, its claw much smaller than those of the other digits.

Skull more bowed and more heavily built than in *Dactylopsila*; muzzle shorter, the zygomata more boldly expanded; posterior nares narrower.

Anterior incisors, both above and below, very much stouter and heavier. Molars more disproportionate in size, the anterior larger and the posterior smaller than in the allied form; last upper molar with three cusps only.

This animal has become specialized in a closely similar way to what has taken place in the Aye-Aye (*Daubentonia*), a single finger lengthened and made slender (presumably for searching for grubs in wood), combined with powerful rodent-like incisors for gnawing the grubs out when found. The ends of the upper incisors in *Dactylonax* are worn off abruptly at the end by friction, not with the lower incisors, which touch them in quite a different part, but with some outside objects, such as tree trunks or boughs.

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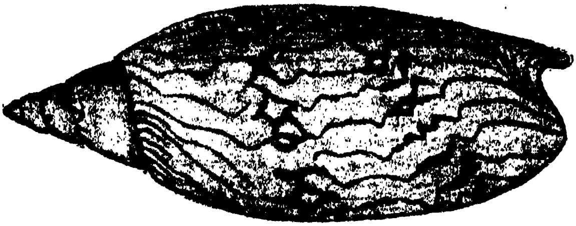
[*] Mém. Cent. Soc. Philom. p. 173 (1888).

LXVII.—*Description of a new Volute.*
By G. B. Sowerby, F.L.S.

The beautiful shell, of which I append a short diagnosis and figure, belongs to Gray's subgenus *Amoria*, several of the species of which are so similar in form that it would be difficult to distinguish them apart from the very striking and constant differences in the character of their colour-markings, which always render them easily distinguishable. I think it therefore convenient to call these shells by the several specific names by which they are so well known, leaving the question of species or varieties an open one.

The shell here described is similar to one figured in the "Voyage of H.M.S. 'Alert,'" pl. v. fig. K (1881–2), as a variety of *V. volva*, from Thursday Island, Torres Straits.



Voluta (*Amoria*) *gatliffi*, Sowerby (figure reduced).

Shell oblong, smooth, with only faint longitudinal striæ or growth-lines; pale flesh- or cream-colour, conspicuously marked with reddish-brown irregularly waved longitudinal streaks, which partly coalesce, forming two broken chain-like transverse bands, with strong mostly angular markings and here and there diamond-shaped spaces. Spire acuminated, rather sharp at the apex, then slightly convex; whorls smooth, very slightly convex; suture distinct, filled with a thin enamel, forming a light orange band. Body-whorl long, rather cylindrical in form, tapering slightly at each end. Columella furnished with four very oblique plaits, and a prominent ridge crossing obliquely from the base of the shell and entering the aperture above the plaits gives the appearance of a fifth. Interior of the aperture smooth, shining, stained with orange-brown.

Length 95, greatest breadth 35 mm.

Hab. Port Keats, Northern Territory, Australia.

I am indebted to Mr. J. H. Gatliff for the opportunity of giving a name to this handsome shell.

LXVIII.—*On* Heterocuma sarsi, *Miers.*
By W. T. Calman, D.Sc.

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[Plate X.]

The genus *Heterocuma* was established in 1879 by Mr. E. J. Miers for a species of Cumacean from the Straits of Korea to which he gave the name *H. sarsi.* Although some details have since been added to the original description by Dr. H. J. Hansen and by the present writer, certain characters of the genus still remain obscure, and the discovery of related forms renders it desirable to attempt a redescription of the surviving co-types of Miers's species.

Heterocuma sarsi. (Pl. X. figs. 1–13.)

Heterocuma sarsi, Miers, Proc. Zool. Soc. 1879, p. 58, pl. iii. fig. 3; Stebbing, Hist. Crustacea (Internat. Sci. Ser.), 1893, p. 304; Hansen, Isop., Cumaceen u. Stomatop. der Plankton-Exp. 1895, p. 56; Calman, Cumacea of 'Siboga' Exp. 1905, p. 8; Zimmer, Cumaceen der deutschen Tiefsee-Exp. 1908, p. 165.

Immature female.—Length of body 17 mm. (fig. 1).

Carapace less than one-fourth of total length, its vertical height a little less than, and its transverse width about equal to, one-half of its length. There is a median dorsal crest anteriorly, which becomes doubled in the posterior half of the carapace; on either side of the crest is a shallow depression, broad anteriorly, but contracting to a narrow groove posteriorly. The breadth of the ocular lobe is more than two-thirds of its length, and it reaches almost, but not quite, to the tip of the blunt pseudorostrum. The eye in some of the specimens still shows traces of dark pigment. The antennal notch is deep and angular and the antero-lateral angle is bluntly pointed and does not extend quite so far as the tip of the pseudorostrum. The surface of the carapace is quite smooth and the lower edge is not serrated.

The free thoracic somites are without ridges and the first is only exposed dorsally, being overlapped at the sides by the second; the posterior thoracic somites are without ventral teeth. The abdominal somites have each a dorsal and a dorso-lateral pair of ridges, but these are very faintly marked. The last somite (fig. 11) has the posterior margin on the dorsal side excavated, with a median tooth, so that the anal valves when closed are visible from above.

The antennules (fig. 3) are short and stout, the first segment of the peduncle about equal to the second and third together, and the second a little shorter and a good deal stouter than the third. Both flagella are present, each composed of two segments; the minor flagellum is shorter than the first segment of the major. The antennæ (fig. 4) have four plumose setæ on the basal segment, and the distal segment is very small.

The mandibles are of normal form, with about 17 spines. The maxillulæ (fig. 5) have a very long and slender palp, more than twice as long as the distance from its base to the tip of the distal lobe, with two apical setæ. The maxillæ are of normal form.

The branchial apparatus (fig. 6) has a large number of lobules (about 40) disposed in a straight row. I was unable to demonstrate the existence of an anterior reflexed lobule, but am not confident of its absence.

The third maxillipeds (fig. 7) have the basis slightly expanded distally, where its width is nearly one-fourth of its length along the inner edge. The distal inner corner forms a short acute tooth; the outer corner is produced as a large bluntly pointed lobe extending as far as the distal end of the merus and fringed with long setæ near the tip. The ischium is narrow, but the merus is produced on the outer side as an acutely pointed lobe tipped with a single long seta. The carpus is expanded on the inner side so as to assume a triangular form.

The first legs (fig. 8) have the basis rather slender and a little shorter than the distal segments together; it has a pair of stout spines on the inner edge near the base, and the distal inner corner forms a small acute tooth. The carpus and propodus are subequal, and the dactylus is two-thirds as long as either; the propodus carries at the distal end of its inner edge a group of very long setæ.

The second legs (fig. 9) are short and stout; the basis is two-thirds as long as the distal segments together and carries a setose styliform exopod extending beyond its distal end; the ischium is suppressed; the merus has a stout spine at its distal inner angle; the carpus is as broad as long and not much longer than the propodus; the dactylus is strongly spinose. The third legs (fig. 10) have a styliform exopod like that of the second legs, but it does not extend beyond the middle of the basis.

The peduncle of the uropods (fig. 12) is a little longer than the last somite and has a row of unequal spines on the inner edge. The rami are somewhat flattened. The endopod is about as long as the peduncle and the exopod somewhat longer. The proximal segment of the endopod is longer than the distal and has a row of spines on its inner edge, a much stouter spine at its distal inner angle, and setæ on its outer edge; the distal segment has spines on the inner edge, increasing in length towards the slender apical spine, and setæ on the outer edge. The exopod has setæ on the inner edge and at the tip only.

Adult male.—Length of body 18 mm. (fig. 2).

The carapace resembles that of the female, except that the antero-lateral angle is more broadly rounded.

The pleural plates of the third free thoracic somite are cut away behind where they are overlapped by a narrow tongue-like lobe from the pleural plates of the fourth somite.

The abdominal somites are without conspicuous ridges; all except the last have well-developed pleural plates.

The peduncle of the antennules is not thickened, the third segment being distinctly narrower than the preceding and with only a few hairs at its distal end.

The flagellum of the antenna is as long as the body and is composed of very short segments which, for the greater part of its length at all events, are not longer than broad. The distal segment of the peduncle is unusually short and slightly inflated.

The legs, including the exopods of the second and third pairs, resemble those of the female.

The endopod of the pleopods (fig. 13) has its outer margin angulated, but not produced into a narrow process.

The uropods resemble those of the female, except that the peduncle carries a brush of short closely set setæ about the middle of its inner edge.

Var. *granulata*, Miers.

The co-types of this variety differ from the typical form not only in the very conspicuous granulation of the carapace, but also in having on all the abdominal somites except the last strongly marked dorsal, dorso-lateral, and lateral pairs of ridges, and a feebler ventro-lateral pair. In addition the appendages, and especially the first legs and the uropods, are a little more elongated. I think it not unlikely that this form may be found to deserve specific rank when more abundant material is obtained.

Remarks on the Genus Heterocuma.—In establishing this genus Miers compared it with *Eudorella* and with *Leptocuma*. Stebbing was apparently the first to place it in the family

Vauntompsoniidæ alongside of *Leptocuma*. Hansen added some important details to the original description, and pointed out that the genus was more closely allied to the Cumidæ (or Bodotriidæ) than to the Vauntompsoniidæ, while suggesting that the two families ought possibly to be united. In describing *H. weberi* from the Malay Archipelago I pointed out that, in the disposition of the thoracic exopods, the type species agreed with *Cumopsis* among the Bodotriidæ. Zimmer, in discussing the matter more recently, comes to the conclusion that the known characters separating *Heterocuma* from *Cumopsis* are not of great importance.

Comparing *Heterocuma sarsi* with the type species of *Cumopsis* (*C. goodsiri*) and of *Vauntompsonia* (*V. cristata*) respectively, it is found to agree with that of *Cumopsis* in the following points:—

(1) In having the dorsal plate of the last somite not produced between the bases of the uropods. In *Vauntompsonia* it is strongly produced, in *Cumopsis* it is transversely truncate, while in *Heterocuma* it is excavated.

(2) In having the minor flagellum of the antennules composed of two segments. In *Vauntompsonia* it is unsegmented.

(3) In having the antennal flagellum of the male composed of very short segments. In *Vauntompsonia* they are very much longer than wide.

(4) In having a large number of branchial lobules.

(5) In having the ischium of the second legs suppressed (for *Vauntompsonia* see Calman, Fisheries Ireland, Sci. Invest. 1904, i. (1905) p. 16, pl. i. fig. 1).

(6) In having unjointed exopods on the second and third pairs of legs in both sexes. *Vauntompsonia* has fully formed exopods on these limbs in the female and also on the fourth in the male.

Additional characters of less importance are found in the first legs, which in *Cumopsis* have a group of setæ on the propodus apparently corresponding to the very long propodal setæ in *Heterocuma*, and in the exopod of the uropods, which has its outer edge devoid of spines in both cases.

On the other hand, *H. sarsi* definitely diverges from *Cumopsis* in the direction of *Vauntompsonia* only in respect of two negative characters:—

(1) The peduncle of the antennule in the male is not dilated distally and carries no brush of setæ.

(2) The endopod of the male pleopods is not produced into a narrow process externally.

In addition to these the form of the third maxilliped appears to be sufficiently different to justify the separation of *Heterocuma* from *Cumopsis* while not bringing it nearer to

Vauntompsonia. At the same time it is quite clear from the characters given above that the first two of these genera are closely allied and cannot be placed in different families.

There remains for consideration the question whether the Bodotriidæ and Vauntompsoniidæ should not, as Hansen has suggested, be merged into one family, and in this connexion the characters of *Heterocuma weberi* are of importance. In this species, of which only a male specimen is known, the second and third legs bear well-developed exopods consisting of an expanded peduncle and a segmented flagellum. I have lately examined specimens of a closely allied species belonging to the U.S. National Museum, which I hope soon to describe elsewhere, which has similar exopods on these legs also in the female sex. In this species, therefore (and no doubt also in *H. weberi*), the female can hardly be distinguished from a *Vauntompsonia* (especially if, as Zimmer suggests, *Bathycuma,* which has similar third maxillipeds, is to be united with *Vauntompsonia*), while the male only differs in having no exopods on the fourth legs. Further, *H. weberi* has a brush of setæ on the antennule of the male as in *Cumopsis.* It seems clear, therefore, that the line of separation between Bodotriidæ and Vauntompsoniidæ can no longer be maintained. It is possible that it may even prove necessary to go a step further than this. From the group formed by the union of these two families it is easy to define the Leuconidæ by the abbreviated form of the mandible and by the possession of not more than two pairs of pleopods in the male; but it is not so easy to be sure that these two characters alone justify the separation of the family. For the present, however, it may be convenient to retain the Leuconidæ as distinct, although they are more closely related to the Bodotriidæ (sens. lat.) than to any of the remaining families of the Cumacea.

EXPLANATION OF PLATE X.

Fig. 1. ***Heterocuma sarsi,*** Miers. Immature female (co-type).
Fig. 2. Ditto. Adult male (co-type).
Fig. 3. „ Female. Antennule.
Fig. 4. „ „ Antenna.
Fig. 5. „ „ Maxillula.
Fig. 6. „ „ First maxilliped and branchial apparatus.
Fig. 7. „ „ Third maxilliped.
Fig. 8. „ „ First leg.
Fig. 9. „ „ Second leg.
Fig. 10. „ „ Third leg.
Fig. 11. „ „ Last somite, from above.
Fig. 12. „ „ Uropod.
Fig. 13. „ Male. Second pleopod.

LXIX.—*On the Specific Names of certain Primates.*
By ANGEL CABRERA, C.M.Z.S.

ALMOST every author who has alluded to the grey, red-vented *Cercopithecus* from South Africa seems to have been in doubt as to whether the name *pygerythrus*, F. Cuv., or *lalandii*, I. Geoffr., should be assigned to it. As a recent instance, Mr. Oldfield Thomas indifferently used both of them in his interesting series of papers on mammals obtained during the Rudd Exploration[*]. By adopting *pygerythrus* in his excellent revision of the genus[†], Mr. Pocock seems to settle the question definitely; but I cannot agree with this conclusion.

Cercopithecus pygerythrus was described and figured by F. Cuvier in the 'Histoire Naturelle des Mammifères' as a green monkey with greenish scrotum, whereas the South-African form is a grey animal and its scrotum is blue. Mr. Pocock bases the selection of Cuvier's name on the argument that the type of *pygerythrus* was "recorded from the Cape"; but that is a mistake, since I. Geoffroy conclusively showed on three different occasions that its locality was quite unknown[‡]. Cuvier himself, in the original description, does not say a word about the locality of the type, but only that several specimens of the same species were obtained by Delalande at the Cape. Now, in the zoological part of the 'Voyage sur La Vénus,' p. 12, I. Geoffroy rightly explains this statement as follows:—

"Dans les immenses collections faites dans l'Afrique australe par Delalande, se trouvaient quelques individus de l'espèce précédemment observée par Thunberg, et avant lui par Levaillant; mais ces individus étaient tous fort jeunes. Lors de l'arrivée en France des collections de Delalande, M. F. Cuvier crut trouver dans ces jeunes Singes le premier âge d'un Cercopithèque qui vivait alors à la ménagerie du Muséum, et dont ce savant zoologiste a fait le type de son *C. pygerythrus*. C'était une erreur, mais une erreur à laquelle il était alors difficile d'échapper: les affinités qui existent entre le *C. pygerythrus* et l'espèce de Levaillant, de

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[*] P. Z. S. 1905, i. p. 255; 1906, i. p. 160, ii. p. 780; 1907, p. 776; 1908, p. 537.

[†] P. Z. S. 1907, p. 735.

[‡] 'Dictionnaire universel d'Histoire Naturelle,' iii. (1842) p. 305; 'Archives du Muséum d'Hist. Nat. ii. (1842) p. 78; 'Voyage autour du Monde sur la frégate La Vénus: Zoologie,' 1855, pp. 10, 13, 29.

Thunberg et de Delalande, sont tellement intimes, qu'ayant sous les yeux, d'un côte, l'état adulte du premier, sans son jeune âge, et, de l'autre, le très jeune âge de la seconde sans son état adulte, on devait être porté à attribuer à de simples différences d'âge les différences que l'on apercevait entre le pelage de l'une et celui de l'autre. M. Frédéric Cuvier n'hésita donc pas à les réunir, et c'est par suite de cette confusion qu'il donna l'Afrique australe pour patrie au *C. pygerythrus*: espèce n'ayant en réalité pour type qu'un individu, acheté de marchands qui ignoraient entièrement son origine, et dont la véritable patrie reste aujourd'hui même inconnue."

I. Geoffroy, who saw the type of *pygerythrus* and compared it with adult specimens of the grey form collected by Verreaux in South Africa, emphasized the difference between them in his "Synopsis" included in the same book (pp. 19–34), describing the Cuvier species as very distinct from the Cape one "par son pelage vert jaunâtre et non gris."

We must, consequently, leave the name *pygerythrus* for a red-vented *Cercopithecus* with green fur, the typical habitat of which is unknown, and adopt another for the grey-coloured form found in South Africa. Desmoulins, who suspected before Geoffroy the distinction between them, calls the latter *C. pusillus*, attributing this name to Delalande*. Unfortunately the name of the French traveller appeared, no doubt accidentally, italicized like that of the animal, thus: "*Cercopithecus pusillus Delalande*"; and it was on account of this that I. Geoffroy considered the term a non-binomial one and rejected it, calling the species *C. lalandii*. Mr. Oldfield Thomas, to whom I applied for his opinion on the subject, thinks the apparently uncorrect name is a printer's fault, as the whole article in which it appeared is written in conformity with the principles of binomial nomenclature; and I entirely agree with his decision. We must therefore call the South-African monkey *C. pusillus*.

Long before the publication of this name, as early, in fact, as in 1811, the same animal was mentioned by Lichtenstein as *C. glaucus*; but no description being given, this name is merely a *nomen nudum*.

Now, if we consider all the *Cercopitheci* with red vent local forms of a single species, the green one, being described the first, will be typical, and *C. pusillus* will become *C. pygerythrus pusillus*. As for the true *pygerythrus*, I think it can be identified with one of the green subspecies.

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* Dictionn. Class. d'Hist. Nat. vii. (1825) p. 568.

According to Mr. Pocock there are two subspecies—*C. p. whytei*, with whiskers completely concealing the ears and very conspicuously banded; and *C. p. centralis*, with whisker-hairs comparatively short, not concealing the ears, and indistinctly banded. The characters assigned to the last agree very well with Cuvier's figure and description of *pygerythrus*, and also with the short description by I. Geoffroy in his "Synopsis." *C. p. centralis* is from Central Africa, and that seems to be the habitat presumed for *pygerythrus* by I. Geoffroy when he says:—

"La presque identité du pelage du *C. pygerythrus* avec celui du *C. sabæus* qui habite le Sénégal, et celui du *C. griseoviridis* [= *C. æthiops*], qui habite la Nubie et le sud de l'Egypte, indique à elle seule une analogie très grande dans la zone d'habitat de ces trois espèces" *.

Of course, the area inhabited by *centralis* was quite unknown to Europeans in Cuvier's time, but I think it not impossible that an isolated specimen reached Mombasa or the Somali coast from the interior of the country through native trade. The total ignorance about the origin of the type specimen of *pygerythrus* and the fact that it was for many years the only red-vented *Cercopithecus* with green hair known to naturalists seem to indicate that it came from a country unknown, or almost so, to white men.

To sum up, I give the synonymy of both the green and the grey forms, according to my views:—

Cercopithecus pygerythrus (F. Cuvier).

1821. ***Simia pygerythra***, F. Cuv. Hist. Nat. des Mammif. livr. xxiv. pl. xxiii.
1822. ***Cercopithecus pygerythreus***, Desmar. Mammal., Suppl. p. 534.
1829. ***Simia erythropyga***, Cuvier, Règn. Anim. sec. édit. p. 92.
1833. ***Cercopithecus pygerythrus***, F. Cuv. Hist. Nat. des Mammif. sec. édit.
1900. ***Cercopithecus centralis***, Neumann, Zool. Jahrb. Syst. xiii. p. 533.
1904. ***Cercopithecus æthiops centralis***, Thomas, P. Z. S. 1904, i. p. 459.
1907. ***Cercopithecus pygerythrus centralis***, Pocock, P. Z. S. 1907, p. 739.

Cercopithecus pygerythrus pusillus (Desmoulins).

(?) 1797. ***Simia sabæa***, var. *a*, Audebert, Hist. Nat. des Singes, fam. iv. sect. ii. fig. 5.
1811. ***Cercopithecus glaucus***, Lichtenst. Reis. Südl. Africa, i. p. 507 [nomen nudum].

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* Voy. Vénus, p. 10.

1825. *Cercopithecus pygerythrus*, Desmoulins (part.), Dict. Class. d'Hist. Nat. vii. p. 560, and authors generally. (Not of F. Cuvier.)
1825. *Cercopithecus pusillus*, Desmoulins (attributed to Delalande), *loc. cit.* vii. p. 568.
1842. *Cercopithecus lalandii*, I. Geoffroy, Dict. Univ. d'Hist. Nat. iii. p. 305.

Cercopithecus pygerythrus is not the only Cuvierian name for a monkey which needs discussion. In the 'Proceedings of the Zoological Society' for 1887, p. 624, Dr. Blanford, referring to the mistake made in calling the crab-eating or common macaque, *Macacus cynamolgus*, called attention to the fact that F. Cuvier named the species *Macacus irus* as early as in 1818 [*]. Afterwards, in the 'Fasciculi Malayenses' (Zool. i. 1903, p. 3), Mr. Bonhote rejects this name and substitutes for it *fascicularis*, Raffles (1822), on the ground that *irus* was really an African monkey; but this view seems to me untenable for the following reasons:—

It is true that Cuvier, in the original description of *Macacus irus*, asserted that the species came from West Africa; but the characters given cannot be referred to any African monkey, and the figures illustrating the extract from the same description in the 'Histoire Naturelle des Mammifères' [†] clearly represent the crab-eating macaque. Moreover, Cuvier himself, in the description of his *Macacus carbonarius* [‡], corrects his former statement about the locality of the common species, giving Sumatra and the neighbouring islands as its true habitat, and confessing he was unaware of the origin of the animal when he described it. The assertion is reinforced by Dr. Anderson's opinion that the "macaque" and the Sumatran "macaque à face noire" of F. Cuvier are only individual variations of the same species [§].

The locality of *Simia fascicularis* being given also as Sumatra, this name becomes a synonym of *Macacus irus*, which antedates it by four years, and must therefore be adopted for the species.

It is a pity that the barbarous specific name *miriquouina* must be used for the South-Brazilian *Aotus* originally described by Don Felix de Azara and currently known as *Aotus azaræ*. The first name is found, as *Pithecia miriquouina*, in the "Tableau des Quadrumanes," published by E. Geoffroy in the

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[*] Mémoires du Mus. d'Hist. Nat. iv. p. 120.

[†] Pls. xxx., xxxi. (1819).

[‡] *Loc. cit.* pl. xxxii. (1825).

[§] Anat. & Zool. Res. Yunnan Exped. i. p. 75 (1878).

'Annales du Muséum,' vol. xix. (1812); *Simia azaræ* appears in the list of South-American monkeys included by Humboldt in his 'Recueil d'Observations de Zoologie,' p. 357. The latter is dated 1811 on the titlepage, but it is evident that page 357 was issued at least in 1812, and after the volume of the 'Annales' for the same year, as the classification and names given by Geoffroy are frequently alluded to by Humboldt in his list.

Coming now to the Lemuroidea, I find that the ruffed lemur must be called *Lemur variegatus* instead of *varius*, the former name dating from 1792, when it was published by Kerr in his 'Animal Kingdom' as *Lemur macaco*, var. *variegatus*, whereas it was only in 1891 that I. Geoffroy first used *L. varius* *.

Tarsius tarsier must also be substituted by *T. spectrum*, as *Lemur tarsier* was employed by Erxleben in 1777 †, antedating therefore the publication of Pallas's name *Lemur spectrum* (1778) by a year.

LXX.—*Ten new Fruit-bats of the Genera* Nyctimene, Cynopterus, *and* Eonycteris. By KNUD ANDERSEN.

FULL descriptions of the forms briefly diagnosed in this paper will appear early next year in the British Museum Catalogue of Megachiroptera.

Nyctimene papuanus, sp. n.

Size small, forearm 54·5–59 mm.; m^1 and m_1 subequal in size to respectively p^4 and p_4; inner cusp of p^3 not completely fused with outer; ears triangularly rounded off above; colour of back not distinctly mottled with dark brownish tips to the hairs; spinal stripe perfectly distinct along the whole of the back, about 3·5–5 mm. broad; sides of neck, breast, and belly much brighter in males than in females (but scarcely any sexual difference in the colour of the upperside). *Hab.* New Guinea generally (specimens examined from various localities in Dutch, German, and British New Guinea); Key Is.; Admiralty Is.; Bismarck Arch.; Cape York.

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* Cat. des Prim. p. 71.

† Syst. Règn. Anim. p. 71.

Type. ♂ ad. (skin and skull), Milne Bay, B. New Guinea, 19th March, 1899, collected by A. S. Meek, B.M. no. 99.12.3.2. Fifteen specimens examined.

Remarks.—Four species of *Nyctimene* are known from New Guinea—*papuanus*, *cyclotis* (described below), *geminus* (below), and *aëllo*. *N. papuanus* is so much smaller than *N. geminus* (forearm 70·5–77 mm.) and *N. aëllo* (81·5–84) that a confusion with these is hardly possible. From the small *N. cyclotis* it is readily distinguished by the relative size of m^1 and m_1 (in *cyclotis* conspicuously smaller than, respectively, p^4 and p_4), the shape of the ears (in *cyclotis* unusually broad and semicircularly rounded off above), and the colour of the fur (back in *cyclotis* mottled with dark brownish tips to the hairs, spinal stripe rather ill-defined).

Nyctimene minutus, sp. n.

General size as *N. albiventer* (forearm about 51 mm.); m^1 and m_1 not reduced in size; inner cusp of p^3 completely fused with outer; ears as in *N. papuanus*; colour of back distinctly mottled with dark brownish tips to the hairs; dorsal stripe very narrow, somewhat ill-defined, and confined to posterior two-thirds of back. *Hab.* Celebes.

Type. ♀ ad. (skin and skull), Tondano, Minahassa, N. Celebes, collected by Dr. A. R. Wallace, B.M. 7. 1. 1. 271 (Tomes Collection).

Remark.—The only other species of *Nyctimene* known from Celebes is the considerably larger *N. cephalotes* (forearm 60·5–69 mm.).

Nyctimene varius, sp. n.

Closely allied to *N. minutus*, as small as, or only very little larger than, that species (forearm 55 mm.), but with considerably heavier teeth (c–m^1 10, against 8·8 mm.); fur longer, more woolly and spreading; colour of back coarsely mottled with dark brownish tips to the hairs; spinal stripe confined to posterior half of back. *Hab.* Known only from the island of Buru, presumably generally distributed over the Amboina group.

Type. Ad. (skin and skull), Mt. Mada, Buru, Sept. 1898, collected by A. Everett, presented by the Hon. W. Rothschild, B.M. 10. 11. 13. 1.

Remark.—From the only other species of the genus known to inhabit the Amboina group, viz. *N. cephalotes* (forearm

60·5–69 mm.), this form is at once distinguished by its smaller size, fused cusps of p^3, mottled colour of back, and feebly developed spinal stripe.

Nyctimene cyclotis, sp. n.

Size small (forearms of type broken, estimated length 53 mm.); premolars and molars peculiarly short and broad, subcircular in outline (character particularly pronounced in p^4 and m^1, p_4 and m_1); m^1 reduced to about $\frac{2}{3}$ or $\frac{3}{4}$ the size of p^4, m_1 slightly smaller than p_4; ears unusually broad, nearly as broad as long, and semicircularly rounded off above; back mottled with brownish tips to the hairs; a narrow spinal stripe along posterior half of back. *Hab.* New Guinea.

Type. ♂ ad. (al. and skull), Arfak Mts., N.W. New Guinea, collected by A. E. Pratt, B.M. 10. 7. 16. 9.

Nyctimene geminus, sp. n.

Similar to *N. major* (Bismarck Archipelago), but smaller (forearm 70·5–77, against 78–85·5 mm. in *major*); males differing by the more brownish-drab colour of the fur (in *major* ash-grey or greyish hair-brown). *Hab.* B. New Guinea; Kiriwina Is.; D'Entrecasteaux Is.

Type. ♂ ad. (skin and skull), south of Huon Gulf, B. New Guinea, collected by Dr. P. Comrie, B.M. 76. 7. 5. 10. Four specimens examined (compared with ten of *N. major*).

Nyctimene scitulus, sp. n.

Similar to *N. geminus*, but free edge of bony palate triangular (in *geminus* semicircularly concave), and ears conspicuously smaller (14 mm. from orifice, against 16 in *geminus*); general size as *geminus*, forearm 71·5–80 mm. *Hab.* Solomon Islands; so far known from Shortland, New Georgia, Florida, and Guadalcanar.

Type. ♀ ad. (al. and skull), Aola, Guadalcanar, collected by C. M. Woodford, B.M. 88. 1. 5. 11. Five specimens examined.

Cynopterus sphinx gangeticus, subsp. n.

Like *C. s. sphinx*, but averaging conspicuously larger: Skull, lambda to gnathion 33–36 (in *C. s. sphinx* 31·5–34·5), forearm 73–78 (66–73·5), third metacarpal 46–51·5 (42–47·5), tibia 28·5–31 (25–27·5) mm.

Type. ♀ subad. (skin and skull), Lucknow, September 1908, collected by Major A. Begbie, presented by the Bombay Natural History Society, B.M. 10. 11. 14. 1. Three specimens examined.

Remarks.—*C. sphinx* (*marginatus*, auct. plur.) falls into two well-marked geographical races. The smaller *C. s. sphinx* ranges from Ceylon northward along the western side of the Peninsula at least as far as Bombay, and along the whole of the eastern side to Bengal, Assam, and N. Siam (in Assam and N. Siam it meets the extreme northern outposts of *C. brachyotis angulatus*). The larger *C. s. gangeticus* is probably generally distributed over the north-western and central provinces of India, but so far identified only from Lucknow and Nasik.

Cynopterus brachyotis javanicus, subsp. n.

Similar to *C. b. brachyotis*, but skull averaging slightly heavier, external dimensions somewhat larger: Breadth across external surfaces of crowns of m^1–m^1 8·5–9·7 (in *C. b. brachyotis* 7·7–9·2), forearm 61·5–68 (57–66) mm. *Hab.* Java, generally distributed.

Type. ♂ ad. (skin and skull), Buitenzorg, 7th Aug., 1907, collected by Guy C. Shortridge, presented by W. E. Balston, Esq., B.M. 9. 1. 5. 71. Twenty-three specimens examined (compared with a hundred of *C. b. brachyotis*).

Remark.—The difference between this, the Javan, race and the typical *C. brachyotis* is very small indeed; single individuals are often difficult or impossible to allocate to subspecies, and it is only on close examination of a sufficiently large series of both races that the average difference becomes appreciable.

Cynopterus brachyotis insularum, subsp. n.

Like *C. b. javanicus*, but averaging larger: forearm 66·5–69·5, third metacarpal 42–46 mm. (38–42 in *javanicus*). *Hab.* Kangean and Mata Siri Islands, Java Sea.

Type. ♂ ad. (skin and skull), Kangean Is., 21st Nov., 1909, collected by Guy C. Shortridge, presented by Oldfield Thomas, Esq., B.M. 10. 4. 6. 11. Six specimens examined (including two from Pulo Mata Siri in the U.S. National Museum).

Eonycteris major, sp. n.

Distinguished from *E. spelæa* by its considerably larger size, and different colour of the fur. Measurements of type, an adult female (in parentheses those of eight adult females of *E. spelæa*; females of the genus *Eonycteris*, it should be noted, average noticeably smaller than males): Forearm 79·5 mm. (61·5–70·5), third metacarpal 54 (42·5–49·5), mandible from condyle 30·5 (25–27·5), c–m^2, crowns 13·8 (12–13·2). Back approximately Vandyck-brown, underparts paler, nearly café-au-lait. *Hab.* Borneo.

Type. ♀ ad. (skin and skull), Mt. Dulit, N. Borneo, 2000′, Sept. 1896, collected by Dr. Ch. Hose, B.M. 8. 1. 27. 28.

Remarks.—*E. spelæa* ranges from Burma and Siam south to Sumatra and Java. In Borneo it is apparently replaced by *E. major*, in Celebes by *E. rosenbergi*. The latter species has hitherto, without sufficient reason, been placed in a distinct genus, *Callinycteris*.

BIBLIOGRAPHICAL NOTICES.

Memoirs of the National Museum of Melbourne, No. 3. Published by Order of the Trustees. 1910.

In this memoir, the joint work of Prof. Baldwin Spencer and Mr. J. A. Kershaw, a most interesting collection of subfossil bird and marsupial remains, from King Island, Bass Strait, is described.

The bird-remains referred to are those of a new species allied to the dwarf emu of Kangaroo Island (*Dromæus peroni*), for which the authors propose the name *D. minor*. A considerable number of bones, in a more or less fragmentary and friable condition, have been obtained, and these seem to show that while the King Island bird was considerably smaller than the existing emu (*D. novæ-hollandiæ*), it was larger than the black emu of Kangaroo Island. The skulls obtained were unfortunately in a very imperfect condition.

Owing, no doubt, to the fact that the authors are perforce obliged to carry on their work out of the reach of large libraries, they have had to obtain such facts as they could in regard to the Kangaroo Island emu from indirect sources. Thus they make but a passing and casual reference to the skeleton of this bird in the Florence Museum, and are apparently unaware that it was described at some length in the Trans. Zool. Soc. vol. xv. part 5 (1900).

"One very striking fact," remark the authors, "in regard to the Ratitæ is that on insular areas we find a most remarkable development of distinct species, and that on continental areas there is a widespread distribution of a limited number of species.

"Throughout the whole of the South American continent we find only three species of *Rhea*; Africa has only three species of *Struthio.*

"Throughout the whole of Australia there is only one species of Emu. Six living species of *Apteryx* are recognized in the islands of New Zealand, where there also exist the remains of at least twenty species of *Dinornis* and closely allied genera. In Australia there is one species of Cassowary: on the Papuan Islands to the north there are no fewer than ten species, and of these one species may be confined to one island . . . . or several may occur on the same island, as in the case of New Guinea.

"It is thus apparent that for some reason or another an insular environment is associated with considerable variation amongst Ratite birds."

Their description of the first discovery of the wombat is interesting. That the credit of this discovery belongs, as is generally supposed, to Bass, is apparently based on a mistake. According to the authors, the earliest known wombat was secured on Clarke Island, in Bass Strait, and taken alive to Sydney in 1797. There is no record of the name of its discoverer. After lingering in captivity six weeks this animal was despatched by the then Governor of New South Wales to the Newcastle Philosophical Society. Later, in 1800, it was figured in Bewick's 'History of Quadrupeds.'

The subfossil remains here described differ in no important degree from living species.

Fourth Annual Report of the Committee of Control of the South African Locust Bureau. 8vo. Cape Town, 1910. Pp. 59, with 2 Coloured Plates and 15 Maps.

"THE South African Locust Bureau was formed in 1906 through the instrumentality of the Earl of Selborne, then His Majesty's High Commissioner in South Africa." The present volume includes reports of the appearance of the two most important locusts of South Africa, the Red-winged and the Brown Locust (*Cyrtacanthacris septemfasciata* and *Pachytylus sulcicollis*) from Cape Colony, Natal, Transvaal, Orange River Colony, Rhodesia, Basutoland, Bechuanaland Protectorate, Swaziland, Mozambique, German South-west Africa, and Nyasaland. Insects, whether injurious or not, are always very uncertain in their abundance, and the Red-winged Locust has latterly almost disappeared from the British possessions. On the other hand, large swarms of the Brown Locust from the Kalahari Desert in March, 1909, spread over a considerable portion of the adjoining territories; but, owing to the energetic measures taken against them, were not able to effect permanent harm. The use of poison and other means of combating these pests are applied systematically, with the cooperation of the various governments, and the locust-pest in South Africa seems now to be well under control. It is hoped that South Africa will suffer comparatively little from locusts during the next few years, at any rate. Various interesting matters connected with locusts and the birds which prey upon them will also be found in this Report, in addition to the practical details of distribution and prevention which form its main subjects.

W. F. K.

Fische der Süd-See.—Part IX. By Dr. ALBERT GÜNTHER. Being Heft xvii. of the 'Journal des Museum Godeffroy.' Hamburg (L. Friederichsen & Co.), 1910. 4to.

THE history and scope of this work have been shortly outlined in a notice in the 'Annals' for December 1909, together with a more detailed account of Part VIII. The promise therein given of a further contribution to our knowlege of the 'Fische der Süd-See' during the present year has been fulfilled, and it is a matter for congratulation to the author and to ichthyologists alike that with the appearance of the ninth part this sumptuously illustrated monograph now stands completed. And if, on the other hand, we must regret that during the progress of the work the author should have found the close examination of minute structure to be too trying for his failing eyesight, we must be glad that he could avail himself of the valuable experience of Mr. Tate Regan, of the British Museum. For this and for other help received thankful reference is made in the Preface.

The concluding part of the 'Fische der Süd-See' is concerned with the families of *Murænidæ* (with 81 species) and *Pegasidæ* (2 species), with the *Lophobranchii* (16 species), *Plectognathi* (76 species), *Selachoidei* (20 species), and *Batoidei* (14 species). The distinction and limitation of the species of some of the generic types, for instance of the Murænas, is exceedingly difficult, and can be successfully undertaken only with the aid of long series of examples, such as are found in the British Museum. The author urges repeatedly that certain species inhabiting coral-reefs are especially subject to infinite variation of colour: compare, for instance, the two plates of *M. undulata* (pls. 164 and 165). The dentition, too, usually so trustworthy a taxonomic character, can, in the Murænas, be employed with caution only; for it not only undergoes changes with age, but individuals of the same size and, presumably, similar age may differ in respect of the number and arrangement of their teeth.

Under such circumstances the compilation of the synonymy must have been an unusually laborious task. Of *Muræna meleagris* not less than 11 synonyms are enumerated, of which seven are introduced in recent American literature. Under *Muræna undulata* are 15 synonyms, of which 3 are due to Richardson, 3 to Bleeker, and 5 to American authors.

There is a wide field of research open to naturalists and travellers who may have opportunities of studying the fishes of the Pacific Ocean in their natural environments. Our knowledge of their development and of the changes which they undergo with age is infinitesimal. In the case of *one* species only (*Ostracion cornutus*) has the author been enabled to describe and figure a progressive series of juvenile forms.

The utility of the whole work has been much enhanced by the alphabetical index which has been prepared by Dr. L. Friederichsen. It is a laborious and most meritorious undertaking, extending over 48 columns, which will be of the greatest assistance in referring to any of the 910 species of Pacific fishes described in the three magnificent volumes.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

November 9th, 1910.—Prof. W. W. Watts, Sc.D., M.Sc., F.R.S., President, in the Chair.

The following communication was read:—

'Jurassic Plants from the Marske Quarry.'
By the Rev. George John Lane, F.G.S.

The Marske quarry is situated on the northern side of the Upleatham outlier in the Cleveland district of Yorkshire. It is about 500 feet above sea-level. In the quarry several varieties of rock are exposed, namely shales, small coal-seams, sandstones, and a ferruginous bed. The beds are of Lower Oolite age, and belong to the Lower Estuarine Series. As the Millepore Bed is absent in the district, the Lower Estuarines and the Middle Estuarines may be one continuous deposit. From this quarry *Dictyozamites* was recorded for the first time in England, its occurrence being made the subject of a paper presented by Prof. Seward to the Geological Society in 1903. The writer has obtained nearly forty species from the quarry, among which are many characteristic Wealden plants. This discovery is most interesting, especially when one considers the vast interval of time that elapsed between the horizons of the Inferior Oolite and the Wealden.

MISCELLANEOUS.

Report of the International Commission on Zoological Nomenclature.

[We have received an advance copy of the Report of the International Commission on Zoological Nomenclature (Graz meeting), from which we reproduce the following as particularly interesting to the readers of the 'Annals.'—Eds.]

Financial Aid from the Smithsonian Institution.—Owing to the amount of clerical work connected with the studies conducted by the Commission, it has been found very difficult in the past for the

Commission to render its decisions as promptly as desirable. This difficulty has now been overcome by the generous grant of the sum of $2700 by the Smithsonian Institution; said sum is available at the discretion of the Commission at any time during the three years following the grant.

In addition, the Smithsonian Institution has placed at the disposal of the Commission the sum of $500 to be used in publishing the "Opinions" rendered by the Commission in its function as a Court of Appeal. An arrangement has been made between the Secretary of the Smithsonian Institution and the Secretary of the Commission, whereby the "Opinions" will be published by the Institution and forwarded to 1100 libraries, to the members of the International Zoological Congress, and to a limited list of specialists.

Official List of most frequently used Zoological Names.—There is a desire on the part of some zoologists that certain very commonly used zoological names should be excepted from the application of the *Law of Priority*, and a proposition to this effect has been presented to the Commission from the British Association for the Advancement of Science and the Eastern Branch of the American Society of Zoologists. That this desire is so widespread and so deeply rooted as is assumed by some of our colleagues has not been confirmed by inquiries made by several members of the Commission. Further, an effort made by the Secretary to collect from zoologists the most commonly used and most important generic names has as yet met with such poor success that the conclusion does not seem entirely unjustified that some of our colleagues who may be in favour of such a list are not as yet sufficiently enthusiastic over the proposition to induce them to demonstrate their desire by placing into the hands of the Commission the data upon which such a list must of necessity be based. Further, there are many colleagues who are known to us to be directly and enthusiastically opposed to such a list.

After careful consideration of the subject and of the many difficulties involved the Commission has decided to propose to the Congress the trial of a proposition which it is hoped will meet with the approval of both sides of the controversy, namely:—

(1) The Commission invites all zoologists to send to the Secretary of the Commission, prior to November 1, 1910, a list of 100 zoological generic names which they consider should be studied in connection with the preparation of an "official list." Each name should be accompanied either by the name of the author of the generic name or by an indication of the group to which it belongs.

(2) All systematists are invited to send a separate list of the 50 to 100 generic names in their specialty which they look upon as the most important and most generally used. Each name should be accompanied by the full and complete

original bibliographic reference, by the name of the type species, determined according to Art. 30 of the International Rules, and by the name of the order and family to which the genus belongs.

(3) All zoologists and palæontologists who give courses in General Zoology are invited to supply the Secretary with a list of the text-books used in said courses, so that said books may be indexed for generic names.

(4) The Commission will alphabetize all the generic names sent in, and will endeavour, according to circumstances, to determine which are the 100 to 500 most commonly quoted genera.

(5) The genera selected will be submitted to specialists in the groups in question, who will be requested to submit opinions on the nomenclatorial status of said names.

(6) Upon return of the lists from the specialists the Commission will endeavour to test the names, according to the International Rules, and if feasible will publish a list of the genera in question, with their most commonly used names and their correct names.

(7) If the undertaking is successful the zoologists of the world will be invited to give to the Commission the benefit of their criticisms not later than July 1, 1912, so that the Commission can restudy the names and submit to the next Congress

(8) *An official list of generic names*, with their genotypes, and with the

(9) Proposition that the Congress adopt said list, and a

(10) Resolution to the effect that no zoologist shall upon NOMENCLATORIAL grounds change any name in said list unless he first submits to the Commission his reasons for making the change, and unless the Commission considers the reasons valid.

The Commission believes that this proposition is feasible, but for the present views it in the light of an experiment, dependent to no small extent upon the question whether a proper amount of co-operation is forthcoming. In this connection the Commission takes the liberty of inviting attention to the fact that the great advances in nomenclature have been made by colleagues who have showed a conviction in their view sufficient to induce them to devote some time to the subject.

INDEX TO VOL. VI.

ACCARANA, new species of, 382.
Achatina, new species of, 533.
Acidalia, note on species of, 245.
Aclytia, new species of, 191.
Acomys, new species of, 220.
Acraga, new species of, 414.
Acrotomodes, new species of, 518.
Adelaidena, characters of the new genus, 468.
Ægeria, new species of, 156, 181.
Æliomorpha, new species of, 94.
Aferulus, new species of, 535.
Agabotus, new species of, 85.
Agonoscelis, new species of, 95.
Agoræa, new species of, 405.
Agyrta, new species of, 191.
Alæognatha, new species of, 179.
Alestes, new species of, 542.
Alluaudella, characters of the new genus, 114.
Alouatta discolor, note on, 422.
Altha, new species of, 148.
Amatembuna, characters of the new genus, 97.
Amaurinia, new species of, 246.
Amaxosana, characters of the new genus, 92.
Amblyomma, new species of, 299.
Amphaces, new species of, 599.
Amphipoda, notes on, 31.
Anacraga, new species of, 415.
Ancara, new subspecies of, 444.
Andersen, K., on new fruit-bats, 621.
Anisodes, new species of, 240.
Anisoporas, new species of, 521.
Anodontites, new subspecies of, 499.
Anomala, new species of, 65.
Anoplius, new species of, 74.
Antestia, new species of, 214.
Apatelodes, new species of, 400.
Aphyle, new species of, 402.
Apluda, new species of, 147.
Apodemus, new species of, 460.
Arachnida, new, 276, 299, 367.
Arbelodes, new species of, 121.
Argyrotome, new subspecies of, 437.
Arrow, G. J., on new Bornean beetles, 64.
Arvicanthis, new species of, 313, 399, 429.
Arvicola, new species of, 34.
Aspongopus, new species of, 221.
Astyochia, new species of, 525.
Asura, new species of, 443.
Atelocera, new species of, 79.
Austen, E. E., on new African phlebotomic diptera, 337.
Austromalaya, new species of, 376.
Automolis, new species of, 199, 402.
Azygophleps, new species of, 129.
Barbus, new species of, 549.
Barilius, new species of, 555.
Barrella, characters of the new genus, 367.
Bathrus, new species of, 382.
Batracharta, new species of, 445.
Bertholdia, new species of, 202.
Bethune-Baker, G. T., on new heterocera from New Guinea, 441.
Biomphalaria, characters of the new genus, 535.
Birthama, new species of, 177.
Blaviodes, characters of the new genus, 441.
Blechroma, new species of, 232.
Books, new:—The South African Journal of Science, vol. vi. no. 6, 141; Morley's Catalogue of British Hymenoptera of the Family Chalcididæ, 142; Tutt's Natural History of the British Butterflies, 247; Pycraft's History of Birds, 333; Alcock's Catalogue of the Indian Decapod Crustacea, pt. 1, fasc. 2, 440; Memoirs of the National Museum of Melbourne, no. 3, 625; Fourth Annual Report of the South African Locust Bureau, 626; Günther's Fische der Süd-See, pt. ix., 627.
Bordeta, new species of, 451.
Borrichias, characters of the new genus, 595.
Boulenger, G. A., on new freshwater fishes from West Africa, 424; on fishes from Angola, 537.
Brycea, new species of, 406.
Bryoptera, new species of, 508.
Buliminus, new species of, 532.
Bunomys, characters of the new genus, 508.
Byrne, L. W., on a new fish from south-west of Ireland, 294.
Cabrera, A., on new carnivora from N.E. Africa, 461; on the specific names of certain primates, 617.

Cadicera, new species of, 342.
Calidota, new species of, 407.
Callipseustes, new species of, 439.
Callomelitta, new species of, 356.
Calman, Dr. W. T., on Heterocuma sarsi, 612.
Cambogia, new species of, 316.
Capreolus capreolus, new subspecies of, 297.
Carruthers, R. G., on the evolution of Zaphrentis delanouei, 143.
Casandria, new species of, 205.
Casinycteris, characters of the new genus, 111.
Caura, new species of, 90.
Censorinus, characters of the new genus, 598.
Centronia, new species of, 207.
Cephaloplatys, new species of, 473.
Cercopithecus, on the specific names of certain species of, 617.
Cerithiopsis, new species of, 10.
Cerithium, new species of, 10.
Chionæma, new species of, 442.
Chlamydopsis formicicola, remarks on, 57.
Chrysichthys, new species of, 557.
Chrysochlorosia, new species of, 176.
Chrysopoloma, new species of, 176.
Chrysops, new species of, 343.
Cicinnus, new species of, 417.
Claphe, new species of, 561.
Cockerell, T. D. A., descriptions and records of bees, 17, 160, 272, 356.
Cœnobasis, new species of, 147.
Coleoptera, new, 43, 64.
Colla, new species of, 414.
Columbella, new species of, 11.
Connolly, Major M., on the S. African Stenogyrinæ, 250.
Contheyla, new species of, 140.
Contipus, new species of, 53.
Copidryas, new species of, 108.
Coptotrophis, new species of, 46.
Cornillus, new species of, 52.
Coryphodema, new species of, 133.
Cossus, new species of, 132.
Cristaria, new species of, 499.
Crocidura, new species of, 112, 310, 427.
Crollius, new species of, 85.
Crossoia, new species of, 5.
Cryptocheilus, new species of, 75.
Curvella, new species of, 270, 533.
Cuspicona, new species of, 589.
Cyclopelta, new species of, 220.
Cyclostrema, new species of, 2.
Cyllopoda, new species of, 239.
Cynopterus, new subspecies of, 623.
Cyromys, characters of the new genus, 507.
Dactylonax, characters of the new genus, 610.
Dalaca, new species of, 156.
Dalcera, new species of, 177, 416.
Dalcerides, new species of, 416.
Dalsira, new species of, 215.
Dasyprocta, new subspecies of, 505.
Dasysphinx, new species of, 189.
Dasystole, new species of, 521.
Deilemera, new species of, 448.
Desmodillus, new subspecies of, 395.
Devarodes, new species of, 525.
Diacrisia, new species of, 169, 443.
Dicrostonyx, new species of, 37.
Diospage, new species of, 406.
Diploptera, new, 100.
Diploxys, new species of, 91.
Dippilana, characters of the new genus, 372.
Diptera, new, 337.
Dispariphes, new species of, 276.
Distant, W. L., rhynchotal notes, 77, 212, 369, 465, 585.
Dollman, G., on new mammals, 226; on mammals from Lake Ngami, 388; on Alouatta discolor, 422.
Donovania, new species of, 15.
Dorcalœmus, characters of the new genus, 337.
Dorcasia, new species of, 212.
Dregea, characters of the new genus, 81.
Druce, H., on new African and S. American heterocera, 168.
Dryadocoris, new species of, 89.
Duomitus, new species of, 130.
Dyromys, new species of, 459.
Ebonius, new species of, 51.
Ectenus, new species of, 383.
Egnasia, new species of, 445.
Elæognatha, new species of, 179, 203.
Eloria, new species of, 407.
Ennea, new species of, 527.
Eonycteris, new species of, 625.
Epichnopteryx, new species of, 117.
Epimys, notes on species of, 397; new species of, 430.
Episcopsis, new species of, 189.
Epitonium, new species of, 4.
Eractheus, new species of, 83.
Eragisa, new species of, 577.
Eribotes, new species of, 470.

Erocha, new species of, 178.
Erupa, new species of, 183.
Ethalia, new species of, 6.
Eubordeta, new species of, 452.
Eucereon, new species of, 192.
Euchætes, new species of, 407.
Eucymatoge, new species of, 331.
Eumecopus, new species of, 377.
Euonyma, new species of, 261.
Euphyia, new species of, 320.
Eupithecia, new species of, 432.
Eupolemus, characters of the new genus, 596.
Euproctis, new species of, 446.
Euptychopoda, characters of the new genus, 244.
Euryaspis, new species of, 98.
Euryglossa, note on species of, 167.
Euryglossidia, characters of the new genus, 358.
Eustema, new species of, 580.
Eutropius, new species of, 555.
Evans, T. J., binomical observations on some British millipedes, 284.
Evius, new species of, 198.
Exorhabdus, characters of the new genus, 53.
Farigia, new species of, 578.
Fishes, new, 294, 424, 537; on the anatomy and classification of Teleostean, 481; on the origin and evolution of Teleostean, 484.
Fluxina, new species of, 7.
Forster-Cooper, C., on Microchœrus erinaceus, 89.
Fulton, H. C., on land-shells from Muswar Island, 211; on an undescribed species of Dorcasia, 212.
Garceus, note on the genus, 594.
Gavara, new species of, 149.
Gellia, new species of, 217.
Geological Society, proceedings of the, 143, 628.
Gibbulina, new species of, 526.
Glomeris limbata, remarks on, 285.
Gnathonemus, new species of, 425.
Gonopsis, new species of, 219.
Grammatostomias, characters of the new genus, 295.
Graphiurus, new species of, 393.
Gymnelema, new species of, 134.
Gymnopteryx, new species of, 519.
Gyomya, characters of the new subgenus, 607.
Haas, Dr. F., on new Unionidæ, 496.
Halictus, new species of, 272.
Hamalia, new species of, 242.
Hammaptera, new species of, 324.
Hampson, Sir G. F., on new African moths, 116, 145.
Heliactinidia, new species of, 406.
Helicarion, new species of, 58.
Heliophobius, new species of, 315.
Hemijassa ocius, note on, 32.
Hermolaus, new species of, 94.
Heterocampa, new species of. 580.
Heterocuma sarsi, note on, 612.
Heteroptera, new, 77, 212, 369, 465, 585.
Heterosomata, on the origin and evolution of the, 484.
Hiarchas, characters of the new genus, 601.
Hillieria, characters of the new genus, 476.
Hinton, M. A. C., on new late pleistocene voles and lemmings, 34.
Hirst, L. F., on new species of ticks, 299.
Hirst, S., on new species of ticks, 299; on a new genus and species of Solifugæ, 367.
Hister, new species of, 54.
Histeridæ, new, 43.
Hololepta, new species of, 43.
Holt, E. W. L., on a new fish from south-west of Ireland, 294.
Homorus, new species of, 534.
Hyaleucerea, new species of, 195.
Hyalinaria, characters of the new genus, 456.
Hyalurga, new species of, 206.
Hydata, new species of, 234.
Hymenoptera, new, 17, 72, 100, 160, 272, 356.
Hypercydas, new species of, 451.
Hyphorma, new species of, 135.
Ibaka, characters of the new genus, 213.
Ichneumenoptera, new species of, 155.
Idalus, new species of, 196.
Ippatha, characters of the new genus, 370.
Iridopsis, new species of, 516.
Iscadia, new species of, 178.
Ixodidæ, new, 299.
Julidæ, bionomical observations on the, 288.
Kalkadoona, characters of the new genus, 476.
Kayesia, new species of. 78.
Koogobatha, characters of the new genus, 590.
Kumbutha, characters of the new genus, 369.
Labeo, new species of, 425, 544.

Lane, Rev. G. J., on Jurassic Plants from the Marske quarry, 628.
Lasiophanes, new species of, 328.
Lebedodes, new species of, 118.
Leggada, new subspecies of, 312.
Leggadina, characters of the new subgenus, 606.
Lepidopoda, new species of, 151.
Lepidoptera, new, 116, 145, 168, 189, 232, 316, 402, 432, 441, 508, 561.
Leptocheirus, remarks on the genus, 33.
Lepton, new species of, 16.
Lepus, new subspecies of, 400.
Leuciris, new species of, 437.
Lewis, G., on new Histeridæ, 43.
Limnæa, new species of, 59.
Lönnberg, Dr. E., on the British roe-deer, 297.
Lophiomys, remarks on the species of, 222.
Lophocampa, new species of, 169.
Lophosoma, new species of, 204.
Lydekker, R., on the hornless okapies, 224.
Lymantria, new species of, 447.
Macalla, new species of, 181.
Macroplectra, new species of, 136.
Macrotarsipus, new species of, 152.
Magwamba, characters of the new genus, 216.
Mambara, new species of, 457.
Mammals, new, 34, 111, 184, 223, 226, 280, 291, 297, 310, 393, 426, 458, 461, 501, 503, 603, 607, 621.
Manatha, new species of, 116.
Manders, Lt.-Col. N., description of Parantirrhœa marshalli, 298.
Mangilia, new species of, 13.
Marcusenius, new species of, 540.
Marmosa, new species of, 502.
Martensia, new species of, 529.
Marthula, new species of, 576.
Meade-Waldo, G., on new species of diploptera, 100.
Megachile, new species of, 278, 359.
Megalopyge, new species of, 416.
Melanolophia, new species of, 500.
Melese, new species of, 202, 402.
Melittia, new species of, 149, 180.
Melvill, Dr. J. C., on mollusca from the Persian Gulf &c., 1.
Menaccarus, new species of, 80.
Meneatheus, new species of, 469.
Menida, new species of, 586.
Meroglossa, new species of, 18.
Mesocia, new species of, 416.
Metarbela, new species of, 124.
Meticulodes, new species of, 522.
Microchœrus erinaceus, note on, 39.
Microtus, new species of, 35, 459.
Microxydia, new species of, 435.
Milionia, new species of, 453.
Miller, G. S., on new European mammals, 458.
Millipedes, on some British, 284.
Mimela, new species of, 64.
Minacraga, new species of, 416.
Miresa, new species of, 139.
Mitra, new species of, 12.
Mochus, characters of the new genus, 600.
Mollusca, new, 1, 58, 212, 250, 496, 526, 611.
Monda, new species of, 116.
Monema, new species of, 147.
Monilea, new species of, 3.
Munduala, characters of the new genus, 384.
Mungos, new subspecies of, 231.
Muritha, characters of the new genus, 373.
Mus, on the generic arrangement of the Australian murines hitherto referred to, 603.
Mutela, new species of, 62.
Myappena, characters of the new genus, 585.
Mycoolona, characters of the new genus, 475.
Mygoodano, characters of the new genus, 592.
Naprepa, new species of, 583.
Narragodes, new species of, 434.
Natada, new species of, 138.
Nectomys, new subspecies of, 185.
Nematogobius, new species of, 560.
Neocrollius, characters of the new genus, 212.
Neomazium, characters of the new genus, 465.
Neostollia, characters of the new genus, 480.
Nephodia, new species of, 523.
Nervicompressa, new species of, 449.
Nodularia, new species of, 496.
Nomia, new species of, 276.
Nyctimene, new species of, 621.
Nystalea, new species of, 574.
Obtortio, new species of, 9.
Ochrodota, new species of, 403.
Odaxothrissa, new species of, 541.
Odontotarsus, new species of, 77.
Odynerus, new species of, 101.

Odysia, new species of, 512.
Œcomys, new species of, 187, 504.
Œnetus, new species of, 458.
Okapies, on the hornless, 224, 387.
Olceclostera, new species of, 410.
Opeas, new species of, 267.
Opharus, new species of, 405.
Ophiusa, new species of, 445.
Opisthoxia, new species of, 437.
Orgyia, new species of, 408.
Orthonama, new species of, 318.
Orthoptera, new, 114.
Oryzomys, new species of, 186.
Otocyon, new species of, 462.
Otomys, new species of, 311.
Oxyambulyx, new species of, 448.
Pachycræerus, new species of, 56.
Pachydota, new species of, 404.
Pachyprosopis, new species of, 166.
Pangonia, new species of, 339.
Papuina, notes on species of, 211.
Paradoxurus, new species of, 230.
Paralebeda, characters of the new genus, 119.
Paramaraue, characters of the new genus, 449.
Parantirrhœa marshalli, description of the female of, 298.
Paraphanta, new species of, 137.
Parasa, new species of, 146.
Parasphecodes, new species of, 274.
Pegala, new species of, 590.
Pellucens, characters of the new genus, 447.
Pentobesa, new species of, 576.
Pericopis, new species of, 170, 208.
Perizoma, new species of, 326.
Perodicticus, new species of, 426.
Perusia, new species of, 436.
Petersius, new species of, 543.
Petrocephalus, new species of, 539.
Phæomolis, new species of, 196.
Phaloe, new species of, 210.
Pheosia, new species of, 177.
Phortion, new species of, 531.
Phragmatœcia, new species of, 128.
Physailia, new species of, 557.
Pilipectus, characters of the new genus, 443.
Pitymys, new species of, 460.
Platylister, new species of, 50.
Platysoma, new species of, 51.
Pleurotomella, new species, of, 14.
Podocerus dentex, note on, 33.
Pœcilometis, new species of, 380.
Polydesmus complanatus, remarks on, 286.
Polypterus, new species of, 424.
Preston, H. B., on new mollusca from Central Africa, 58; on mollusca from British and German E. Africa, 526.
Primates, on the specific names of certain, 617.
Prionomys, characters of the new genus, 226.
Procolax, characters of the new genus, 584.
Prohydata, new species of, 235.
Prosopis, new species of, 25, 160.
Proteles, new subspecies of, 464.
Protoxæa texana, note on, 275.
Prout, L. B., on new Neotropical Geometridæ, 232, 316, 432, 508.
Prumala, new species of, 197.
Psaliodes, new species of, 328.
Pseudælia, characters of the new genus, 478.
Pseudagenia, new subspecies of, 76.
Pseudomys, remarks on the genus, 605; new species of, 607.
Pseudophyllodes, new species of, 456.
Psyche, new species of, 117.
Ptychoglene, new species of, 176.
Ptychorhynchus, new species of, 498.
Racheospila, new species of, 236.
Rachis, new species of, 531.
Rarisquamosa, characters of the new genus, 450.
Regan, C. T., on the anatomy and classification of the Zeomorphi, 481; on the origin and evolution of the Heterosomata, 484.
Retusa, new species of, 16.
Rhinomyza, new species of, 349.
Rhipidomys, new species of, 501.
Rhynchalastor, characters of the new genus, 110.
Rhynchotal notes, 77, 212, 369, 465, 585.
Ridewood, Dr. W. G., on hornless okapies, 387.
Rifargia, new species of, 583.
Rissoa, new species of, 7.
Sarrothripa, new species of, 444.
Schaus, W., on new heterocera from Costa Rica, 189, 402, 561.
Schwarz, E., on two new Oriental Viverridæ, 230.
Sciapteron, new species of, 153.
Sciocoris, new species of, 466.
Sciurus, new subspecies of, 503.
Scordylia, new variety of, 433.
Selagena, new species of, 120.
Semæopus, new species of, 241.
Sepontia, new species of, 480.

Sesamia, new species of, 444.
Shelford, R., on a new cavernicolous cockroach, 114.
Smileuma, characters of the new genus, 323.
Solariella, new species of, 3.
Somara, new species of, 140, 145.
Sorex, new subspecies of, 458.
Soritia, new species of, 455.
Sowerby, G. B., on a new species of Voluta, 611.
Sparganis, new species of, 329.
Spatha, new species of, 63.
Staphylinochrous, new species of, 149.
Stauralia, new species of, 602.
Stenalcidia, new species of, 513.
Stenogyrinæ, on the S.-African, 250.
Stenomys, characters of the new genus, 507.
Stenothoë validus, remarks on, 31.
Subulina, new species of, 59.
Susica, new species of, 140.
Sylvisorex, new species of, 113.
Syngnathus, new species of, 559.
Tamyra, new species of, 181.
Tantia, characters of the new genus, 216.
Tatera, new species of, 394, 428.
—— nigricauda, note on, 291.
Taterillus, characters of the new genus, 222; new species of, 293.
Teinostoma, new species of, 6.
Teleostean fishes, on the anatomy and classification of the, of the order Zeomorphi, 481; on the origin and evolution of the, of the order Heterosomata, 484.
Teragra, new species of, 125.
Terebra, new species of, 12.
Teretriosoma, new species of, 47.
Teretrius, new species of, 49.
Thapsia, new species of, 58, 530.
Theseus, new species of, 374.
Thetomys, characters of the new subgenus, 606.
Tholosanus, new species of, 476.
Thomas, O., on a new genus of fruit-bats and two new shrews from Africa, 111; on mammals from the River Supinaam, 184; on African rodents, 221; on mammals from Mount Kilimanjaro, 308; on new African mammals, 426; on mammals from N.E. Brazil, 500; on new S. American rodents, 503; on new genera of Australian Muridæ, 506; on the generic arrangement of the Australian murines hitherto referred to Mus, 603; on new Australian Muridæ, 607; on a new genus for Dactylopsila palpator, 610.
Thosea, new species of, 138.
Thynnus, new species of, 72.
Tinthia, new species of, 150.
Tonatia, new species of, 184.
Trichocossus, characters of the new genus, 133.
Trigona, new species of, 366.
Trigrammia, new species of, 438.
Tropicorypha, new species of, 87.
Tropidophora, new species of, 536.
Trosia, new species of, 416.
Trypanæus, new species of, 44.
Tuerta, new species of, 169.
Turner, R. E., notes on fossorial hymenoptera, 72.
Turris, new species of, 15.
Turrubulana, characters of the new genus, 385.
Unio, new species of, 59.
Uranomys, new species of, 431.
Vandiemenia, characters of the new genus, 587.
Varicorhinus, new species of, 545.
Vitellus, new species of, 593.
Voluta, new species of, 611.
Walker, A. O., notes on Amphipoda, 31.
Warrenia, characters of the new genus, 321.
Wilmore, A., on the carboniferous limestone south of the Craven fault, 144.
Wroughton, R. C., on African gerbils of the genera Tatera and Taterillus, 291.
Xenopepla, characters of the new genus, 238.
Xenopomatichthys, new species of, 542.
Zanola, new species of, 412.
Zeomorphi, on the anatomy and classification of the, 481.
Zinara, new species of, 137.
Zoological nomenclature, Report of the International Commission on, 628.

END OF THE SIXTH VOLUME.

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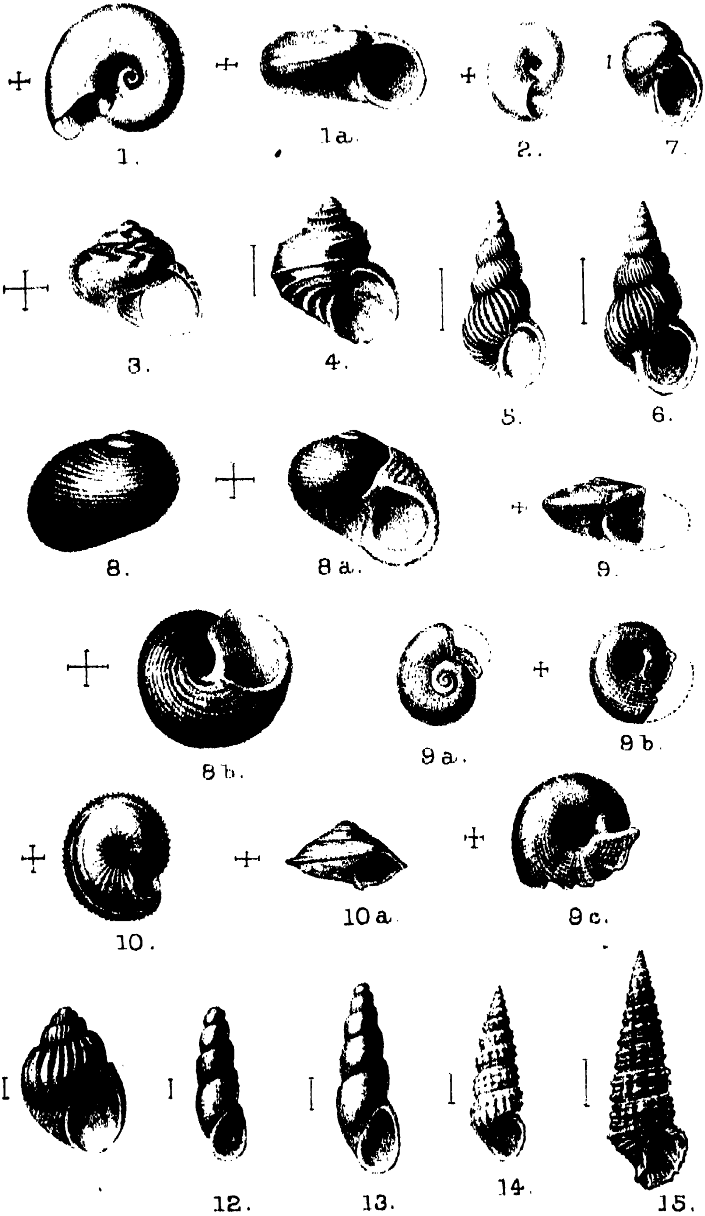

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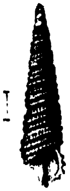
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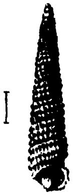
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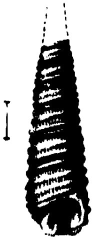
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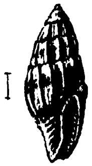
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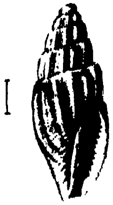
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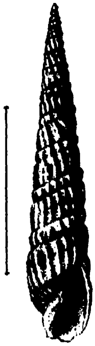
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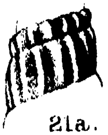
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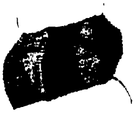
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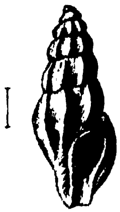
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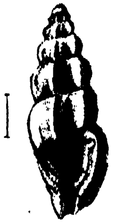
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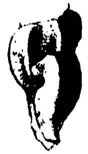
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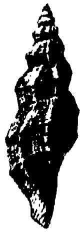
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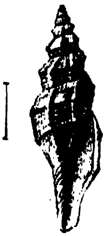
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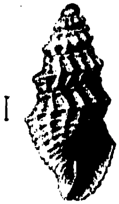
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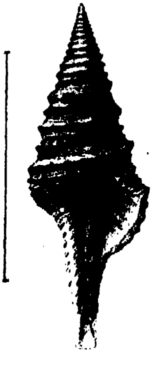
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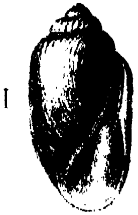
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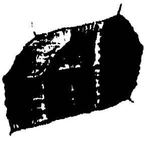
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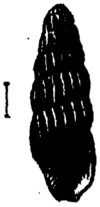
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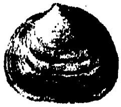
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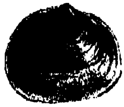
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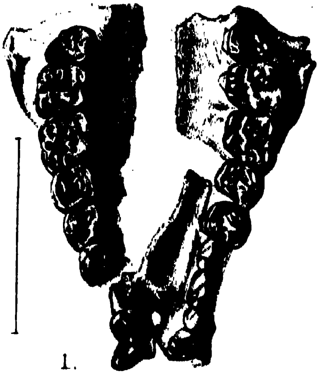

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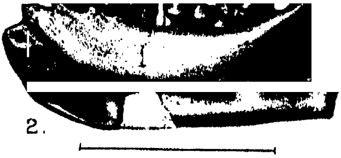

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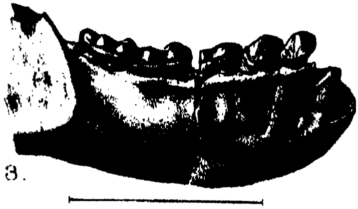

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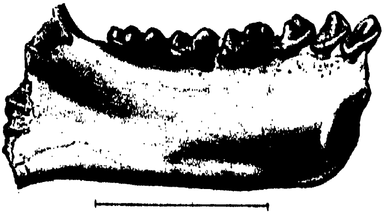

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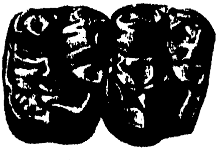

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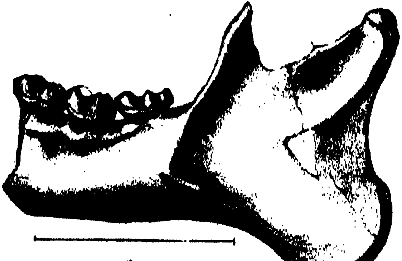

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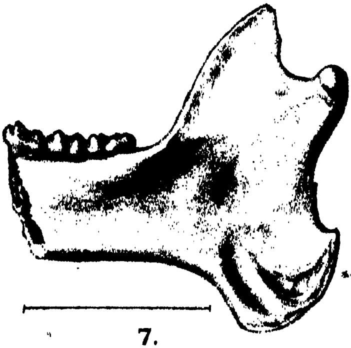

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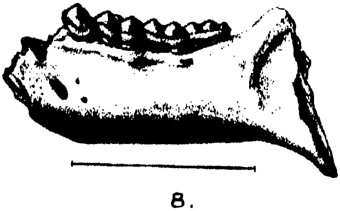

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Ann. & Mag. Nat. Hist. S. 8. Vol. VI. Pl. IV

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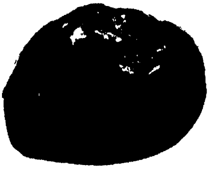

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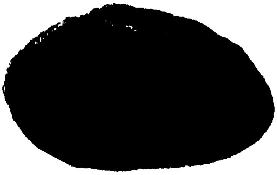

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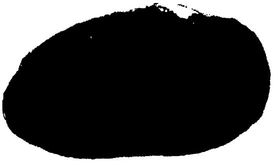

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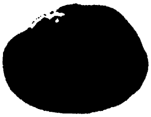

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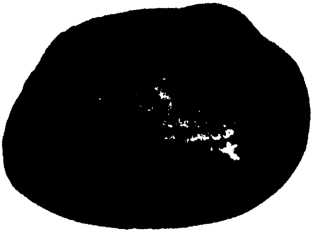

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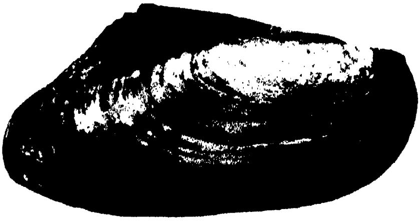

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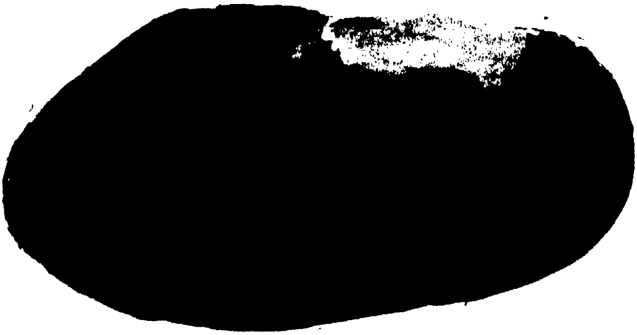

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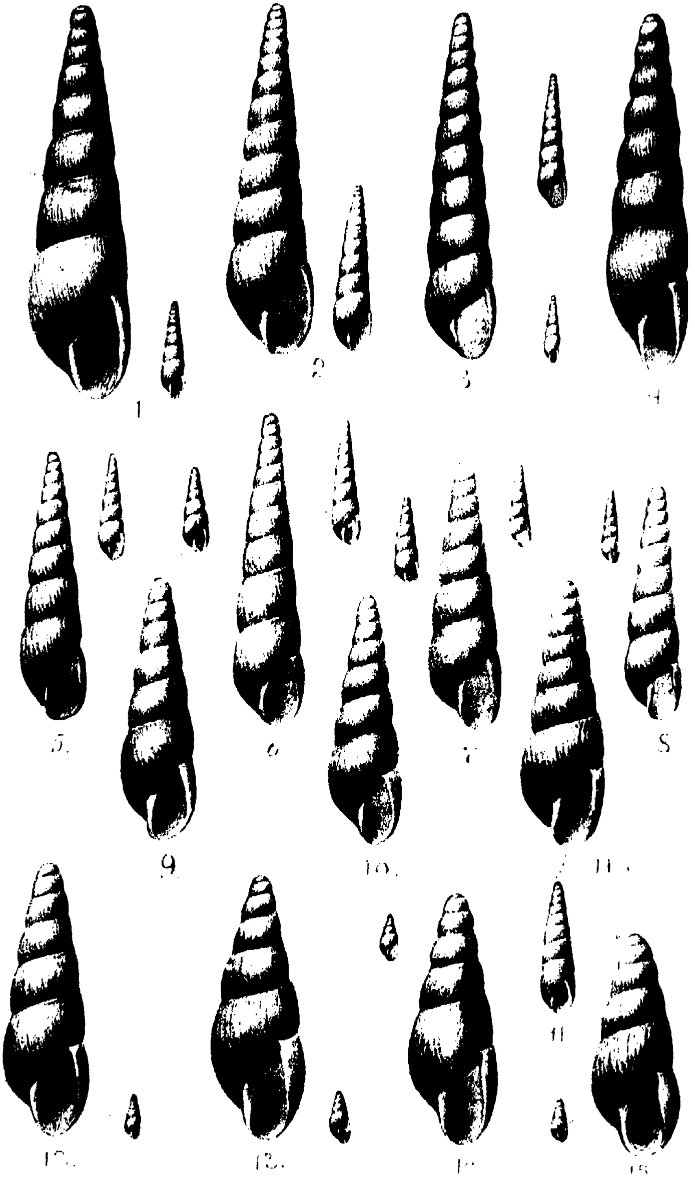

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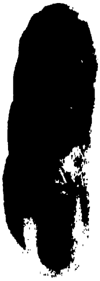

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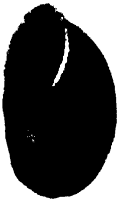

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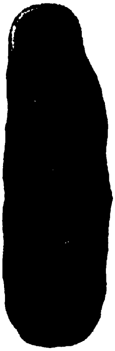

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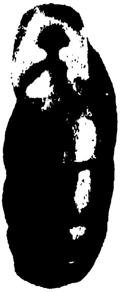

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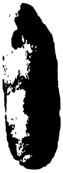

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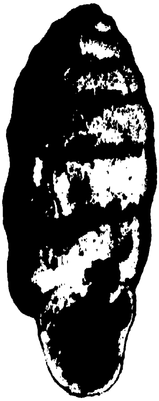

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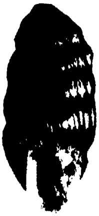

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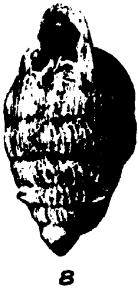

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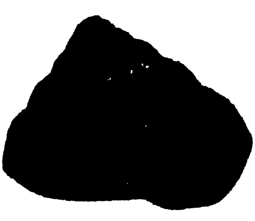

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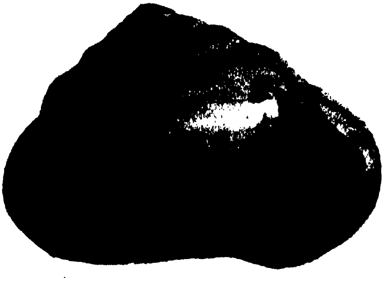

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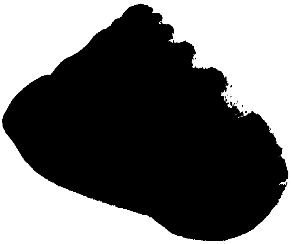

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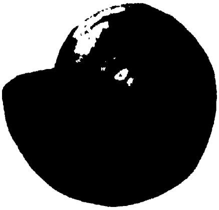

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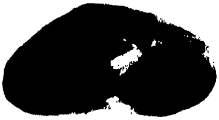

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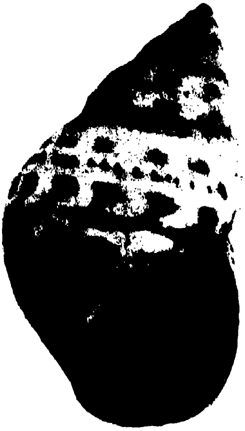

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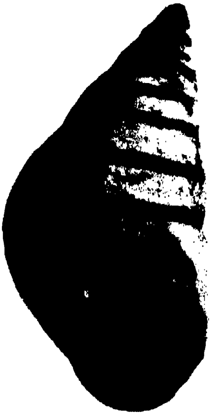

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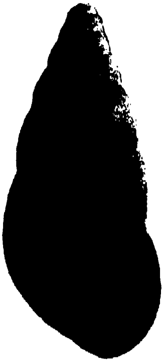

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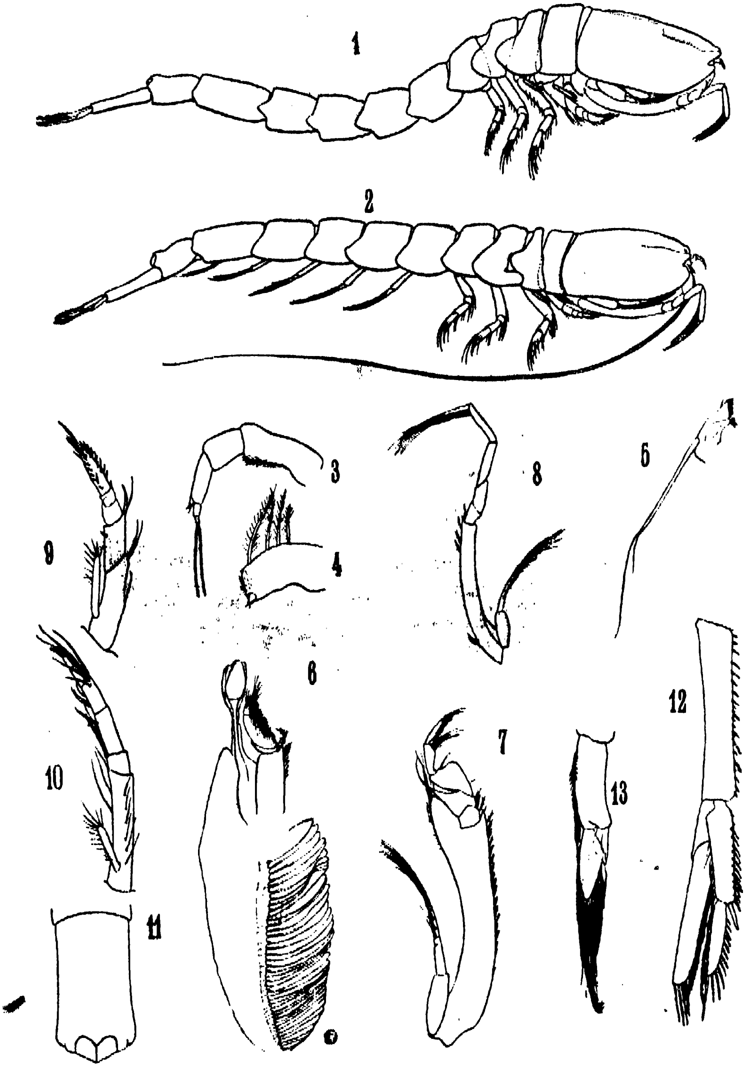

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